

RECORD OF PROCEEDINGS OF A
COURT OF INQUIRY
CONVENED AT
TRIAL SERVICE OFFICE PACIFIC
BY ORDER OF
COMMANDER IN CHIEF
UNITED STATES PACIFIC FLEET
TO INQUIRE INTO A COLLISION
BETWEEN USS GREENEVILLE (SSN 772) AND
JAPANESE M/V EHIME MARU THAT OCCURRED
OFF THE COAST OF OAHU, HAWAII
ON 9 FEBRUARY 2001
ORDERED ON 17 FEBRUARY 2001
AS AMENDED ON 22 FEBRUARY 2001;
26 FEBRUARY 2001;
1 MARCH 2001; AND
9 MARCH 2001

Onboard USS GREENEVILLE (SSN 772)
Naval Station, Pearl Harbor, Hawaii
Tuesday, 6 March 2001

The court met at 0822 hours onboard USS GREENEVILLE (SSN 772) for a site tour.

CC: Let the reflect that all members, parties, and counsel are present. The court has procedural matters to consider. Mr. Charles Gittens and CDR Jennifer Herold, counsel for CDR Waddle, are not present. In addition, Legalman Second Class Wright, one of our court reporters for yesterday, is not present as well.

CC: At this time, I will swear LT Van Winkle.

[LT Van Winkle was sworn by the Counsel for the Court.]

Questions by Counsel for the Court:

Q. Would you please state your full name, spelling your last name, for the record?

A. My name is LT Mark David Van Winkle,
V-A-N-W-I-N-K-L-E.

Q. What ship are you assigned to, LT Van Winkle?

A. I am assigned to the USS GREENEVILLE as the Combat Systems Officer.

Q. And your purpose today is to assist in walking the court through the various equipment that's onboard the USS GREENEVILLE in the Control Room, correct?

A. That's correct, sir.

CC: At this time, we will return to testimony by RADM Griffiths. Admiral, if you would take the Court and Parties through the various watchstations in the Control Room, Sonar Room, and Radio Room onboard USS GREENEVILLE, and briefly describe the duties of those watchstanders. Also, if you would indicate the actual positions of watchstanders on the afternoon of 9 February. Also, describe briefly, the equipment in the Control Room, Sonar Room, and the Radio Room, and as well as the location of distinguished visitors as best as you can recollect from your Preliminary Inquiry.

RADM GRIFFITHS: The first sense I am sure you are getting from being here in the Control Room is it's confines. You're looking at a space that is half filled with equipment and the remainder available for people, so you understand that an ability to see across the space, particularly when it is filled with people is impeded. There are displays particularly around the forward and the outside peripheries of the space that provide tactical data to the operator. Depending on where you are standing and how many people are in Control, your sight vision of that equipment may be impeded.

There are some equipments here in the Control Room that I'm not personally familiar with, particularly the PC driven computer displays that are now proliferating the fleet since I last drove ships at sea or rode them frequently on this class. And that's why I will occasionally ask the Weapons Officer to stand in and give me an up to date explanation of some of these displays and black boxes. But in general this is the class of submarine I operated and was in command of about a decade ago or more. And I think I can start by working with the forward port corner of the Control Room where the Ship's Control stations are. Starting with the Chief Petty Officer who was in the vicinity of the Ballast Control Panel and the forward port corner of Control, who I am pointing to now. Chief, would you raise your hand?

[The Chief did as directed.]

RADM GRIFFITHS: He is sitting in the position known as the Chief of the Watch, one of the four watchstanders directly associated with the routine mechanical operation of the ship while it is operating at sea, either submerged or surfaced.

RADM GRIFFITHS: This Chief Petty Officer here--would you raise your hand Chief?

[The Chief did as directed.]

He is sitting in the Diving Officer of the Watch's seat between the outboard station, or Stern Planesman, and the inboard station, or Helmsman. Between the three of them, they directly control the course, the speed, the depth, and the angle and attitudes of the ship. The Diving Officer of the Watch, who I am touching on the shoulder

now, further is the backup to the Officer of the Deck on a routine basis as the number two person in charge in the Control Room and in the forward end of the ship's watchstanders, so he in effect acts as the executor of the Officer of the Deck's orders in a general sense. He ensures that the Officer of the Deck's desires are carried out.

The Chief of the Watch, also normally either a Senior Chief Petty Officer or a Chief Petty Officer, is his forcible back as the number two backup to the Officer of the Deck. Focusing again on the Ship's Control Party members, here are the inboard stations that are closer to the centerline on the submarine.

Here we have the Helmsman, and he has a dual function. Routinely, he would operate both the rudder by turning the wheel left and right, and also the bow planes by pushing and pulling on the yoke such as an airplane would do. And I don't know if the device is in an operable condition now, but Helmsman if it is, would you show how you would turn the steering wheel left and right and then also--disregard. You can pantomime with your hands turning the wheel right and left and that would move the rudder right and left and then push in with the yoke pantomiming and bringing it back would effectively make the planes--cause the bow to go down or up. These bow planes are in the front of the ship and can be rigged in when you are on the surface, but normally when you are at sea and getting ready to submerged and operating submerged, they would be rigged out, so they would be available to be used at small wings there on either side of the bow and help control depth.

The outboard station, because it is farther to the outboard side of the submarine, is the Stern Planesman and he would push and pull on his yoke in order to make the stern planks cause the angle on the ship to go up or down. Now there is some commonality to their functions and they are able to trade off. In fact, you could have one person do everything and in various combinations, so if you have training or casualty modes you could shift the functions between these two operators, but in general the description that I have provided is the standard operation and I would expect that is what the GREENEVILLE was doing on the 9th of February.

This petty officer here [pointing to Messenger] is in the Messenger's seat, and as I described in the court, he is kind of a jack of all trades. He is qualified to probably relieve either of these two operators. They do have partake factor and an the attention span issue, so they are routinely rotated on schedules that could perhaps last 30 minutes or more frequently. He also runs messages physically throughout the ship, forward end of the ship, for the Chief of the Watch and the Diving Officer, and brings refreshments to the watchstanders in Control because they are physically required to stay in Control and not go get them themselves. He makes wakeup calls and so forth.

In summary, that is the ships Control Party watchstanders. And where they are positioned right now is probably where they were for most of that morning and afternoon in question on the GREENEVILLE.

Now, one issue that I know received a lot of publicity is that a civilian guest operated the emergency control--the emergency ballast control valves. Chief, would you just touch the two valves in question there?

[The Chief did as directed.]

They are nicknamed chicken switches. They are what actuates providing 4,500 pounds of high-pressure air to the forward and after ballast tanks. His right hand is on the forward ballast tanks valve and his left hand is on the after ballast tanks valve. Operating both of them in concert provides this large volume of high-pressure air into these ballast tanks on each end of the ship forcing the water out the bottom of the open flood grates and quickly reducing the ship's negative buoyancy and making it positively buoyant forcing it up to the surface. Of course, their basic intent is to recover the ship in case it becomes negatively buoyant and a casualty--or has some other casualty such as an attitude that is forcing it deeper from a stern plane casualty where the like--in order to bring it safely to the surface.

The other civilian guest who received some publicity was sitting in this chair where I'm touching the shoulder of this petty officer, the inboard station or Helmsman controlling the rudder and the bow planes. And again, if the guests were to be seated in the chair and operating the equipment and I were this petty officer overseeing the guest, I would be in a position similar to this. So you can see that everything that this person in the chair would do, I would be in a direct position to supervise directly, and similarly the Chief of the Watch could literally have his hands over the hands of the guests who were on the switches. So the ability to supervise directly is absolute.

RADM GRIFFITHS: That completes the Ship's Control Party brief. Are there any questions on that portion of the brief?

[Negative response.]

RADM GRIFFITHS: Perhaps on a mission, you'll see four circled alarm actuator switches and the Chief is touching the diving alarm, that's the green alarm. There were some media reports that a third civilian guest actuated the three blasts on that diving alarm. Again, this would be something directly supervised by this Chief of the Watch, but of course would have no real bearing on the physical operation of the ship. It's a signal to the crew that they are doing a quote, "emergency surface" and of course, this was an emergency surfacing----

Questions by counsel for CDR Waddle, party (LCDR Young):

Q. Sir, I believe the--it was the klaxon that was pulled?

CC: Could you identify yourself?

Counsel for CDR Waddle, party (LCDR Young): Yes, this LCDR Young.

Q. I believe that the diving alarm that was pushed by the civilian was the klaxon, which is--which the----

A. That's the more traditional noisemaker that the ship has as an option.

Counsel for CDR Waddle, party (LCDR Young): Yes, sir.

RADM GRIFFITHS: Okay.

Counsel for CDR Waddle, party (LCDR Young): The civilian was pushing that button rather than the other.

Counsel for LTJG Coen, party (LCDR Filbert): LCDR Stone, we have no objections to that as well. That's our understanding as well.

Counsel for LCDR Pfeifer, party (LCDR Stone): No, objection.

RADM GRIFFITHS: Let me correct myself for accuracy. There's really parallel devices the ship can use to sound the diving alarm. Because the newer version of the diving alarm, the standard version provided by NAVSEA to the ships, is a little wimpy, many ships have instituted a more traditional klaxon sound device reminiscent of the diesel submarines of your--which provides a more traditional sound. And it's quite common for the ships to use this more traditional klaxon instead as the same function would be used in the same sequence and apparently was used in this case.

MBR (RADM SULLIVAN): This is RADM Sullivan.

Questions by a court member (RADM Sullivan):

Q. RADM Griffiths, will you explain--I noticed there are a number of different depth gauges and compass rows, how those interact with each other and how you--a Diving Officer would use those, particularly going to periscope depth?

A: First of all, it's appropriate when you are trying to control a submarine to make clear that the two Planesman, the Helmsman and the Planesman, operate as a team. The Diving Officer tries to coordinate their efforts, so that their use of the planes is the most efficient as possible to achieve and maintain ordered depth, or ordered angles or any parameters of course. Particularly in an evolution, for example like high-speed turns, they must be a very well oiled team in order to prevent the ship from having undesired large angles and depth excursions while executing a high-speed turn for example.

RADM GRIFFITHS: The displays that the Admiral was asking me to elaborate on are all in this vertical section here

[pointing to displays] of the Ship's Control Panel. There is significant redundancy in these displays. For example, the ship is able to look at its course that it is steering on more than one display. There are ways to parallel from different circuits, independent circuits, these inputs, so you have some redundancy in the case of a material failure.

Similarly, they have a redundancy of the displays that indicate the position of the planes that the Helmsman or the Planesman are attempting to achieve with their movements and again, for material casualty backup and also depending on where you are standing sitting, you may not be able to see one as well as the other. Again remember, they can have common functions and pass between the two, so there is some redundancy in the displays. I am pointing now at a depth gauge.

In the court, I talked about a digital depth gauge, that provided an indication of the ship's keel depth from the surface of the ocean. This is a redundant, really a parallel process gauge, that is more mechanical in nature and does not require electricity that I am touching now. It would be an example of a backup to the digital depth gauge. Now, the digital depth gauge would read in various places. I am pointing here at the digit that apparently says 0028, or 28 feet. And if you could point, Chief, to the outboard station, similar to this--I guess this is a fathometer repeater here, so its a depth under the keel not a digital depth gauge.

This gauge and this outer gauge, which as you can see a different scale from this gauge but is similarly mechanical in nature, shows the types of redundancies we have in key ships indications to aide the Ship's Control Party. Admiral, do you think that covers the basis?

MBR (RADM SULLIVAN): Yes.

RADM GRIFFITHS: Are there any other questions on the ship's Control Party stations or functions?

[Negative response.]

Okay, I would now like to move over to the starboard side of the Control Room. My back right now is to the Contact Evaluation Plot, the CEP plot, and I will step away from

it and you will see the information that is on it. It is basically a display of bearing across the top and times along the side. It is a running history and they just continue to roll this continuous paper up and make new space for new times and merges so that the contact bearings are plotted on here. Now they also plot the course of own ship, which would be this line here that I am tracing which is a black magic marker line which would show the various courses of own ship, and they also annotate next to the courses that own ship steers the ships parameter changes that are ordered. In this case, CD150 means change depth to 150 feet keel depth.

In this case, it says L5 degrees, S/C North. What that means is left 5 degrees rudder, and steady on course North, so they are turning from course 120 to course North and they are turning to the left. You will see annotated right here, which is a blue magic marker line with X's connected by dashes and what that is, is an indication of the bearings to Sierra 25, or sonar contact arbitrary number 25, which is designated here as merch or merchant, so it is a commercial surface contact and it says 103 Tango, which is 103 degrees true and one over five means it has one five-bladed screw, so there is some classification information and 103T appears it may be--- its not a bearing. Clearly, that is the RPM of the shaft of that merchant. That is valuable information for the whole Ship's Control Party because they have thumb rules that are reliable over time that allow them to compute that to a speed of a contact, which is they can choose and pin down one of the variables of a contacts parameters of course, speed and range. Then that allows them to eliminate one of the independent variables and much more quickly and accurately refine the two more independent variables that are left, of course, and range. So, that is good dope from sonar here annotated on the chart and I assume these are representative. I am not trying to duplicate the day in question.

Here [pointing to chart.] they have kept a summary for the observer to show that they have three sonar contacts and what their classification is--what their turn count and screw blade is, and I don't know what B,F and F is. Is that tracker information?

LT VAN WINKLE: Yes, sir. It is tracker information.

RADM GRIFFITHS: These letters in front of these contacts [pointing to chart] on the lines would indicate which contact tracker in sonar--which digital tracker has been assigned to that contact and that is necessary to keep straight because the Fire Control Technician wants to make sure that he has the right trackers assigned to the right contacts in the fire control system and it correlates to what sonar is trying to do so you don't end up thinking that you are tracking this guy over here when you are really tracking this guy over here by confusing yourself between sonar and fire control.

You will also see other annotations on the side of the contact evaluations plot that talk about orders to raise and lower the periscope while at periscope depth and other antennas. The report, "no close airborne contacts," which would be followed by no close contacts or vice versa. Generally, those would be called out by the Officer of the Deck looking through the periscope on that initial safety sweep--or two where he makes sure there is no immediate detection or collision threats.

On the day in question, the airborne contacts would be of less interest to the ship. But the surface contacts, of course, are very consistently of interest no matter what your mission. If you had other sources of contact information, such as at periscope depth, you visually saw a contact, whether or not it correlated through a sonar contact, you would also annotate that on here [pointing to chart]. A general process would be if you have more than one sensor contact on the same target of interest, then instead of saying this is Sierra, Victor, Echo, number 3, you correlate them all to a single master contact number and thereafter would refer to that contact, no matter what the sensor input, as Master 1 or the next arbitrary master number, so that there is a short cut to getting at who that really is in the nomenclature.

Questions by counsel for LCDR Pfeifer, party (LCDR Stone):

Q. RADM Griffiths, would you characterize the CEP plot--Contact Evaluation Plot, as a repository for information that is available elsewhere in the Control Room? Is that sort of a second repository history?

A. I think that is a very accurate characterization. It takes disparate sources and puts them into one easy to read central place so that the drivers of the ship, particularly the Officer of the Deck, the Commanding Officer, and so forth, can quickly see what the situation here is at a glance. This is a paper graph [pointing to graph.] Some of the most modern submarines have had the benefit of installing an electronic version of this. And it has computer aided kind of windows based operator aides, so that you can very quickly put in a much greater amount of information than these paper charts. These are obviously labor intensive. They've been around for many decades and although they are valuable they are not state of the art technology and do require a significant amount of labor. Whenever a ship is on a mission, it would have a person dedicated to this full time doing nothing else.

The ships generally stand down from having a dedicated person do this and share that duty with the other fire control operations operated by the Fire Control Technician of the Watch when they are on routine transit operations. It is up to the ship to decide when things are becoming busy enough so they need to add an additional watchstander to this plot separate from the Fire Control Technician of the Watch operating here in the fire control system, sitting over on the starboard side of control. So, this is an important plot. It's labor intensive. If the Fire Control Technician of the Watch is not able to keep this up adequately because of his other duties and the pace of events, then new people are brought in to man this watch.

Questions by counsel for CDR Waddle, party (LCDR Young):

Q. Sir, is everything that you have pointed out on this CEP plot, is it required to be kept up, and if so, what says it's required to be kept up during routine transit operations?

A. Well, I would have to do some reference research to answer that adequately. However, there is tactical

guidance available to the submarines that discuss, in detail, the maintenance of this plot. What it would do is be more of the mechanics of how to maintain it. You will probably see less guidance on thou shalt, or thou wilt, or this scenario or that scenario. I can tell you that I don't think there is a submarine skipper in the fleet who doesn't think that this is important, and who doesn't want high standards to be maintained in maintaining them.

Counsel for CDR Waddle, party (LCDR Young): Thank you, sir.

RADM GRIFFITHS: I am going to move on to the Fire Control Technician's bailiwick here on the starboard side of Control. There are a number of black boxes and displays here, so let me try to simplify. I am touching now the four displays that are BSY-1 Legacy Fire Control System. These four displays [pointing to displays] this one, this one, this one, and this one, all running fore and aft in a row with the green screens, if you will, for display, are interchangeable. Now, the practice of ships is to set them up in the manner that you see them now and I just say that with a fairly small database. I rode a sister ship a few weeks and it had a very similar choice of which displays would be on which panels. If I were a CO, this would be--make a lot of sense to me, but I just want to make sure that you're clear that these are rarely--arbitrary which functions you display and which of these four screens--they are interchangeable.

In this format, I will try to describe what the four displays are indicating. Then again, they are receiving raw data from all other sensors on the ship that would track contacts. When you are submerged, that is generally just sonar and usually just passive sonar. When you are surfaced or on your periscope depths and the antennas up, it can also include radar, visual from periscope, and electronic signals. The first forward most display here is in a line of sight mode and it tries to depict the own ship at the bottom, and the target ship at the top with their actual courses the bearing line between them, and their actual speeds so that you have a realistic bottom depiction of one ship verses the other, this is the first display.

This is particularly useful when you're doing periscope operations and trying to use your visual assessment of the target's parameters and don't have a lot of sonar information on them. The second display--the second one I have my hand on now, is in a time bearing mode and it's similar to the CEP plot in some respects because it provides the bearings over time. The vertical axis time, the horizontal axis is bearings and when you are submerged, it would be providing a history over time of the bearing change to a given contact, and all sonar contacts, as time evolves.

In the courtroom, you can recall I tried to discuss a chart that showed that one-hour or so history of Sierra 13, bearing versus time. And then I showed you an expanded time bearing plot that showed the latter part of that history where that right 6 bearing rate transitioned to a low left bearing rate as the ship was preparing to and at periscope depth. This is the parallel electronically to what I was showing you. In fact, the data recorder in this system was recording the data that would have also been displayed here to the operator, if he had it selected, that would show that same data. You are able to show all the sonar contacts at the moment you are tracking them, so you would have to have a scale that would allow pretty much a full circle of bearings and all the different bearings rates for the various contacts could be shown all at once, or you can just select a single contact or a few contacts and reduce the scale so you get more of a refined look at the bearing rates and eliminate some of those that you are less interested in. You have some options here on display. I should say these are very versatile displays and you can make a lot of operator selections to enhance the displays for what you're doing at the moment.

This third display aft, is what is called a MATE display or FLIT MATE. In particular, this is the display where you are able to rapidly determine the parameters of a contact when sonar bearings are changing over time. And you're able to drive a difference in true bearing to the target through the use of own ship's maneuvers and the conjunctive maneuvers of the target ship. The more bearing difference over time that you can achieve with quality signal the more rapidly you're able to reduce the subsets of the possible solutions to the one that's true. The more maneuvers you conduct with own ship, the more

you are able to throw out the bad options that fall away as you continue to maneuver and refine the solution.

Now just to try to rephrase what I just said. The more maneuvers you conduct with own ship on a given target, the more accurate and reliable and competent you become in the target parameters that this will display. The fewer maneuvers, the less reliable, the less competent, the less accurate you will be. Now there are a lot of variables that also affect that, like the environment, the source of the signal, interfering contacts, the health of your own systems and so forth. But what I just described in general is a good thumb rule. This system is very good if generated to the target solution given time and enough maneuvers. I do want to emphasize at this point that his system----

Questions by counsel for CDR Waddle, party (LCDR Young):

Q. Excuse me, sir. LCDR Young. Just real quick with regard to the last comment you said. Is it necessary to do a lot of maneuvers to get that same information?

A. The question is, is it necessary to do a lot of maneuvers before you would have a reliable solution, and the answer is not always.

Q. I mean one generated by the system, sir?

A. I think it is fair to say that what this system will generate is a possible solution.

RADM GRIFFITHS: Am I getting in the right direction here?

Counsel for CDR Waddle, party (LCDR Young): Yes, sir.

RADM GRIFFITHS: It is not necessarily the solution. For example, it will provide similar display data for an opening contact, a contact that is driving away from own ship, or a closing contact, that is a contact driving towards own ship, and the operator has no idea of which the truth is, so he will tend to try and evaluate both. As you conduct subsequent maneuvers, it gives him--it helps him--it aids him greatly in eliminating which of the two cases is not the reality. If you only have one or two legs, it is very difficult to determine if it's an opening or closing contact. There are frailties in the tactical use of these systems that can mislead the

operator into thinking one solution is truth when in fact it is not. I think largely that may be the case with Sierra 13 on the day in question.

Questions by counsel for LCDR Pfeifer, party (LCDR Stone):

Q. Could you please discuss the different types of solutions available, cast or mates or some of the others?

A. There are more than one type of solution that this can digitally achieve for you. The KAST acronym stands for a type of algorithm that is computer generated without operator intervention. In other words, hands off it can generate a solution that has some validity on some occasions, particularly if you give it enough time in own ship maneuvers. So, we have one mode where it can provide KAST ranges to the operator and into the systems, which are independent of operator actions largely and are automatically generated. Then there are other solutions, and the ones that are generally used after the operator has the time and the opportunity to start working the problem on that target, which are called MATE and FLIT MATE, which are where you can add in other sources of information about the target when you are able to do more than just broadband analysis.

PRES: Admiral, I am going to have Counsel for the Court talk to everybody again. As the President, I think the intent of this tour was so everyone understood what the Control Room was like as we talked about it on the panel up there yesterday. I wanted to make sure everyone had a chance to physically see what it looked like. We're starting to ask questions now that I think ought to be more properly covered in the courtroom and not here, specifically because I think we want to make sure this is formally--I know it's being formally introduced, but I think we're going to be here a long, long time and stuff we are going to cover again. So, CAPT MacDonald?

CC: Admiral, if you could just give us a brief overview of the various watchstations, so we can move around and just get that orientation and a feel for the spaces.

RADM Griffiths: Understand.

PRES: Are Counsel for the Parties satisfied with that?

Counsel for CDR Waddle, party (LCDR Young): Yes, sir. If he was going to get into discussing the specifics of that day then there were going to be questions. But if we keep it to generalities then no problem, sir.

PRES: We're going to come back and let you do this because we're going to have the opportunity--we're going to talk about it this afternoon in the court room.

Counsel for CDR Waddle, party (LCDR Young): Yes, sir.

PRES: I promise you that. I will give you the opportunity to cover this ground very thoroughly. Alright?

Counsel for CDR Waddle, party (LCDR Young): Thank you, sir. No problem.

Counsel for LCDR Pfeifer, party (LCDR Stone): No objections from LCDR Stone as long as if something that comes out that is just technically wrong that we might have the opportunity. But if it's just----

PRES: If something is wrong we should correct it on the spot.

Counsel for LCDR Pfeifer, party (LCDR Young): Yes, sir.

PRES: Then we'll go--we'll either leave it at that and then move on, but this--the idea is to do the orientation. Okay?

Counsel for LCDR Pfeifer, party (LCDR Stone): Yes, sir.

PRES: To get everyone familiar with what the space looks like, etcetera. RADM Griffiths is covering these things in great detail for us. But you and I know this is so we can go ask the right kind of questions when we come back to the court room.

Counsel for LTJG Coen, party (LCDR Filbert): LCDR Filbert, sir. No objections.

PRES: Alright.

RADM GRIFFITHS: So moving along in summary. This is where the operator does most of his work to refine solutions on targets. Aft of--forward of the displays, this is generally as if you're looking down on all the targets with own ship in the center to show the orientation of all the contacts to own ship. It's called geographic display. It is a good display for the Officer of the Deck and the Commanding Officer, at a glance, to see if he is threatened by any close contacts or has any other technical problems.

I have my hand on the PERIVIS repeater, which is above the third aft console here. This will enable the rest of the people in the party, who can view it, to see what the periscope operator sees if he has the PERIVIS television energized and provides a video key of what the scope is looking at.

I see there's also a second display on the port side of Control just aft of the Ballast Control Panel [pointing to display] on a smaller screen version of where I have my hand here. The periscope operator would use the people in Control as a backup to help him interpret the information that he is seeing through the scope. The panel aft of these four panels is weapons related and has no function I think in this discussion. It's N/A to this discussion. [Pointing to panel.] This is a panel that I believe has to do with countermeasures.

LT VAN WINKLE: Admiral, you are correct. It is used to launch your countermeasures.

RADM GRIFFITHS: It has a tactical value in an engagement with the enemy and again has no value in this discussion--no bearing. [Pointing to display] This display is a repeater of I believe, a sonar repeater, for the BQR-22----

LT VAN WINKLE: Admiral, this is LT Van Winkle. That is correct, that is a repeater for the BQR-22.

RADM GRIFFITHS: As I understand it, it was not in use on the day in question. So it was a dark screen like you see today. [Pointing to repeater.] This repeater is a multi-purpose video, and I'd like the Weapons Officer to elaborate on its use.

LT VAN WINKLE: Admiral, this is LT Van Winkle. Actually, this screen is not hooked into the video LAN. What we have is what used to be part of the TAC-3 computer system. During the latest modification to the TAC-3 system, the TAC-3 was moved all the way to the aft starboard side in the corner there [pointing to corner]. There are a variety of screens throughout the rest of the Control Room that are hooked into the video LAN system, most notably the two that you see here in the front of the Conn. Both screens have a variety of functions they can see throughout the ship including the PERIVIS, a chart. Additionally, you can display TAC-3 screens and various laptop computers can be put into the system to display on these screens for various evolutions.

RADM GRIFFITHS: This flat screen that I have my hand on in the forward starboard corner of Control has other locations throughout the ship where this information is commonly displayed and it can display a variety of information, such as the depth and course of the ship, the bearings that the periscope is looking through and Weps, can you give a more complete discussion?

LT VAN WINKLE: Admiral, this is LT Van Winkle. This is our--what we call Ship's Digital Display or SDD for short. A variety of screens can be displayed and, depending on which work station you are at, you may see different information. In addition to this screen in the Control Room, you will notice above the Diving Officer of the Watch. At the Ship's Control Panel, there is an additional screen there. On these screens, can be shown Ship's Control information i.e., rudder angles, stern plane angles. Additionally, you can also see courses and speeds on various screens in addition to bearings to contacts. Also solutions--correction, I should say sonar trackers and what contacts are assigned to which trackers.

Questions by counsel for CDR Waddle, party (LCDR Young):

Q. Excuse me, LCDR Young. Lieutenant, could you turn it on and select it to periscope observations?

A. Ma'am, I believe the sonar system is tagged out. I'm unable to bring it on at this time for you.

Counsel for CDR Waddle, party LCDR Young): Thank you.

LT VAN WINKLE: Okay. So it has a multiple number of functions of common interest to the whole Control Party depending on what you select. What I'd now like to do is--oh, incidentally, I have Petty Officer Morgan here. Would you please sit in the position normally assumed by the Fire Control Technician of the Watch, so we can see you seated at your watchstation?

PETTY OFFICER MORGAN: Yes, sir [did as requested].

RADM GRIFFITHS: Can you operate this panel [pointing to panels] and the far right panel from where you are seated?

PETTY OFFICER MORGAN: Yes, sir.

RADM GRIFFITHS: So, you can see that seated there, he can operate a number of the panels adjacent to his location as well. Are there other questions on the fire control system or the displays on the starboard side of Control?

CC: Sir, we are not going to take questions. We need you to move us through and describe the various watchstations as generally as you can.

RADM GRIFFITHS: Moving on to the periscope stations, the Conn, now. In the center part of the Control Room, this is the general locality. You can see a raised deck where the Officer of the Deck would stand his watch. He has a very central situational view here of the Ship's Control Party, all the repeaters, the Fire Control Party, the Nav Party aft, and of course if he were at periscope depth, be using the periscopes here.

In general, visitors could stand-on this periscope-raised area when you are not at periscope depth or surfaced without interfering, although, it would be tighter to move around. But once the ship is at periscope depth, you would want to keep this raised deck free of people who weren't physically using the periscopes because of the room you need to walk around the scopes and use them.

There are a few pieces of equipment here that we haven't talked about yet that are important. This one here that I have my hand on, the overhead looking forward, is the AVSDU. This is an Analog-Video Signal Data Unit. This

is the repeater for sonar that was out of commission on the day in question. It provides an ability to a selection of switches here for the Officer of the Deck to view any of the screens on the main legacy BSY-1 sonar displays in sonar. Additionally, this unit here is the sonar intercept display unit repeater, really the main unit in sonar and it is called WLR-9. It is useful to detect any acoustic energy in the water generated by a ship's machinery or its sonars or sound buoys and things of that nature. Weps, I need help on this display [pointing at display].

LT VAN WINKLE: Yes, sir, LT Van Winkle. This is an A-RCI repeater. It is used for towed array screens repeating them out to control. It would not have been in use on February 9th.

RADM GRIFFITHS: Okay, thank you. There is another flat screen moved up out of the way here. I will move it down. Weps, help me with this.

LT VAN WINKLE: Yes, sir, LT Van Winkle. This is a repeater for a noise monitoring system. It is not hooked into any of the main frame sonar systems and would only have been in voluntary use on February 9th.

RADM GRIFFITHS: [Pointing to periscope.] This is the Number 2 periscope. I mentioned that this is a Type 18 periscope. It's a fairly intelligent that has the video for camera, and also has--in the night time it has a low-light intensity version. It has a built-in camera and has an opportunity to change the power through up to 12 power and there is a doubler to get up to 24 power, so it has a lot of magnification. Of course, it can be focused. And it also provides the antennas for ESM to operate their electronic surveillance with. I think it is probably in a position, if you haven't looked through a periscope before, you ought to take a look. If you cock your right hand forward, it is at low-power. Moving your right hand aft puts you way through higher magnifications. Its probably valuable for people to look through that if they haven't. You also can electrically mark bearing to contacts that you are looking at with your left thumb or a button, and that goes into the fire control system. There's a control panel here on the left column [pointing] right now that the Officer of the Deck

would manipulate to ensure that the ESM Operator would be given the right scope of what to listen to.

CC: We need to get some control here. We just want to do a general walk through. We want to keep this extremely general.

RADM GRIFFITHS: More general?

CC: Yes, sir, just the locations, where they were, and let's keep it at that without any demonstrations or things of that nature.

RADM GRIFFITHS: I think the Officer of the Deck would generally be here on the Conning stand, although he would be mobile. He could go to watch fire control, Ship's Control, or other places. Quartermaster of the Watch location would be here [pointing to QMOW location] where LT Fulton is standing between the two navigation plotting tables and on one of the tables would be the chart in use to track the ships position. [Pointing to the left.] Fathometer on the left side there. There would be a radar repeater just behind VADM Nathman on the port side--correction, I guess that's here just to the left behind RADM Sullivan. That's the high frequency sonar repeater behind VADM Nathman, and that was not in use that day.

Finally, there is the underwater communication system here, it's nickname is RAC on this class of ship. It's useful when you're ascending to periscope depth to listen for contacts. It was also in use that day and properly operated.

Now what I'd like to do is move around quickly to the Sonar space. It's going to get a little crowded because it is small.

Questions by counsel for CDR Waddle, party (LCDR Young):
Excuse me. Captain, we do have a questions about how one communicates with the Engine Room.

CC: Can you address the "How to"?

Counsel for CDR Waddle, party (LCDR Young):

Q. LCDR Young, sir. Can you address how one communicates with the Engine Room?

A. There is a number of ways to communicate with the Engine Room. You can just direct your watchstanders to do the communication, or you can pick-up a microphone and use an announcing system. There's also sound powered phones. So you have a number of ways you can pass the orders aft.

Q. Sir, can you show us where the microphones are to talk to those that are maneuvering because that's important?

LT VAN WINKLE: Admiral, this is LT Van Winkle. A variety of methods. First for generic orders, the engine order telegraph would be used giving the Helm direct orders to adjust bells as necessary. From there a variety of methods would be used, either we would use a 7MC to call back to maneuvering directly and/or I may direct my Chief of the Watch to call back on a sound powered phone and give orders to maneuvering that way.

Counsel for CDR Waddle, party (LCDR Young): Thank you.

RADM GRIFFITHS: Okay, on to Sonar. A forward starboard sonar control leads to it. You can see a curtain separates the two. [Pointing to a Chief Petty Officer.] This Chief Petty Officer is acting as the Sonar Supervisor watchstander. He would probably really be standing approximately where VADM Nathman is now. The two Sonar Operators on the stacks that were testified in court, raise your hands please.

[The Sonar Operators did as directed.]

RADM GRIFFITHS: Those are the two BSY-1 consoles that we were talking about in court. The consoles farther forward here are dark screens, and would have been on the day in question because the towed arrays were not deployed. These two operators in this corner of Sonar, and the Sonar Supervisor, are your source of bearing information to provide to fire control. These are interchangeable consoles and one of them had a qualified operator, the other a Seaman. The Sonar Supervisor would be able to operate all the equipment in Control that

wasn't being operated by these two. And that's generally, I think, a summary for this short tour.

CR: What compartment are we in now?

RADM GRIFFITHS: We're in the sonar space, Sonar Control Room, just forward and starboard side of the ship--just forward of Control.

Moving aft now through Control, we'll go to the Radio ESM space.

Questions by counsel for LCDR Pfeifer party (LCDR Stone):

Q. Sir, this is LCDR Stone. Could you explain how you communicate between Sonar and Control?

A. The question was, how do you communicate between Sonar and Control? For one thing, there is an open mike and you can hear it in the overhead here when people talk in Control, they automatically hear it here without the use of any systems. Additionally, they can use microphones to talk to each other and I don't know where the microphone is in here. For example, he would pick up that microphone [pointing to microphone] and talk into it and it would come out on a speaker in Control and vice versa if the OOD wanted to use the speaker into here.

RADM GRIFFITHS: [Moving aft.] This is the Electronic Signals Measurement or ESM portion of the radio ESM Shack, the radio compartment forward of me. The operator for ESM would sit right here [pointing to panel] and these screens display the parameters that the ESM operator would manipulate to refine the ESM signals. He would also orally hear on the speaker here [pointing to speaker] the signals as they came in over the scope antenna. So, you can see that he would be needing some time to analyze this equipment and provide feedback. The forward end of here is radio. You might just tuck your head around--it's actually roomier now than normal because some of the equipment has been removed to prepare for another deployment.

Questions by counsel for CDR Waddle, party (LCDR Young):

Q. Sir, LCDR Young. [Pointing to speaker.] Can you point out what this speaker does, sir?

A. Is this the oral speaker, Weps?

LT VAN WINKLE: Admiral, the speaker your looking that's been made available is the repeater from the Control Room. You can hear everything that's going on----
RADM GRIFFITHS: Okay. Similar to sonar, they hear everything that Control says over an open microphone here in Radio and ESM just to eliminate a lot of unnecessary need for using microphones, so they can keep their situational awareness up here. Because whenever an antenna is up here they need to be working in here. I think that is about it here.

CC: Sir, this is CAPT MacDonald. The last thing that VADM Nathman requested was that you generally describe the location of the distinguished visitors.

RADM GRIFFITHS: Okay, we will need to go back to Control for that.

CR: We are now moving back to the Control Room.

RADM GRIFFITHS: This is the speaker that you would hear the oral indications of the radars on. Adjusting the volume is important to be able to hear something else. The question is, where were the visitors in Control on the 9th of February during that last hour before the collision? My understanding is, what I will describe--I don't know if that's a perfect understanding, and I think further testimony will be needed to refine it. They would probably be here standing, including where the Weps and I are here, again, this is the scope raised and that area right around it would have to be cleared. But you could have some people here on the starboard side----

Questions by Counsel for the Court:

Q. Sir, could I--this is CAPT MacDonald. I'd like to kind of interrupt. Your testimony right now is that they could have been here. Sir, from your Preliminary Inquiry, do you have--do you know where they were or have an idea from your Preliminary Inquiry of where they were?

A. What I will describe is my best understanding of where they were from what I have been able to learn to date. So, it's somewhere between "no and could". The area where I am standing now and further outboard to starboard, and back a little, and forward a little, working our way around here all the way up to this

location right here. And then there would be a slight interruption because of a need to keep this passageway from there--starting where RADM Sullivan is and working back through where LCDR Pfeiffer is and even after that would be the remaining place for the visitors to be. Of course, someone's sitting here and someone over here with the Chief of the Watch [pointing at Chief of the Watch station]. One or two people over here. That's it.

CC: Do any of the parties, Counsel for the Parties, have any questions before we stop this portion of the tour? I would like to give everybody an opportunity to ask any final questions.

CC: Party for CDR Waddle?

Questions by counsel for CDR Waddle, party (LCDR Young):

Q. LCDR Young, sir. Could we ask the Admirals to step back into ESM, so that they could hear what the Early Warning Receiver sounds like in there?

A. Certainly. Okay. Moving back into Radio ESM now to listen to the Early Warning Receiver.

[Listening to receiver].

Counsel for LTJG Coen, party (LCDR Filbert): Is the operator in here? Can you adjust the volume on that a little bit?

EARLY WARNING RECEIVER OPERATOR: Yes, sir. What we are hearing right now is coming over the open microphone.

CC: Can you identify yourself?

EARLY WARNING RECEIVER OPERATOR: I'm Petty Officer Sass--ET2 Sass. The signals we're hearing are actually coming from the Early Warning Receiver in Control and they are coming over the open mike through this right here [pointing].

CC: Okay, this is CAPT MacDonald again. Counsel for CDR Waddle, any other questions?

Counsel for CDR Waddle, party (LCDR Young): Just one other, sir. Can we please put on the record the exact number of people that we have in here right now? By my count, it is 26.

LT VAN WINKLE: I checked that number several times, sir, and it is 26.

Counsel for CDR Waddle, party (LCDR Young): Thank you. Nothing else, sir.

CC: How about counsel for LCDR Pfeifer?

Counsel for LCDR Pfeifer, party (LCDR Stone): No other questions, sir.

CC: And counsel for LTJG Coen?

Counsel for LTJG Coen, party (LCDR Filbert): Yes, sir. I do have one question just to make sure we're thorough on this----

CR: This is LCDR Filbert----

Counsel for LTJG Coen, party (LCDR Filbert): As far as the navigation team, I see we have a Quartermaster of the Watch, but there is not a petty officer who is acting as the NAV Supe. It looks like we're missing one of the people on the navigation team. Is that your understanding, sir?

LT VAN WINKLE: That is correct. The only

CC: No--no--no. RADM Griffiths?

RADM GRIFFITHS: Because of the ships proximity to land, they would probably have a modified piloting party in place. My recollection is they did and that means they would also need a Nav Supervisor, probably a Chief Petty Officer, the ANAV or the Navigator himself. Supervising the Quartermaster here at the plots, that would be an additional person.

CC: Is there anybody else?

Counsel for CDR Waddle, party (LCDR Young): I have one other question. Was there a person----

CR: This is LCDR Young----

Questions by CDR Waddle, party (LCDR Young):

Q. Sir, do you know if there was a person on the fathometer?

A. My recollection is that there was a person on the fathometer, that person would stand next to where the Captain is and be an additional watchstander. That would be also a part of the modified Nav party.

CC: LCDR Stone?

Counsel for LCDR Pfeifer, party: Yes, sir. We have one question.

Questions by LCDR Pfeifer, party:

Q. At the very beginning, sir, you had mentioned that the shallow water depth gauge was a backup. Isn't that actually a primary?

CC: Can this question be asked in court? Seriously guys, we are going to be here a long time and I think--I want to be fair here, but I--at the same time, couldn't you ask this question in court?

Counsel for LCDR Pfeifer, party: I can, sir.

CC: Is there a specific reason you want to ask it now?

Counsel for LCDR Pfeifer, party: Only technically that----

CC: Alright, do we have an answer to that one then?

RADM GRIFFITHS: The answer is the ship's digital depth detector is sometimes the primary, and sometimes the backup, depending on the decision of the Commanding Officer and which he thinks the most reliable indication is. I think the general practice in the Fleet is that the mechanical gauges are less things can go wrong, more reliable, and therefore, the primary depth indicator and the digital would be a backup.

LT VAN WINKLE: Admiral, this is LT Van Winkle. On our ship, the mechanical would serve as the primary depth detection device.

CC: With that, Admiral, I recommend that we recess and reconvene over at the ship's training. Before we go off the record, I would again, my warning to RADM Griffiths and LT Van Winkle that you are not to discuss your testimony this morning with anybody. And with that we will go off the record.

The court recessed at 0923 hours, 6 March 2001.

The court opened at 0945 hours, 6 March 2001.

Let the record reflect that all members, parties, and counsel are present with the exception of Mr. Charles Gittens and CDR Jennifer Herold, counsel for CDR Waddle. Also absent is Legalman Second Class Wright, the court reporter. Legalman First Class Leather is present as the court reporter.

Tom Kyle, Captain, U.S. Navy, was called as a witness for the court, was sworn, and examined as follows:

DIRECT EXAMINATION

CC: CAPT Kyle, what we'd like you to do this morning is please take us through some demonstrations in the attack center. And would you follow that sir, with emergency surface procedure demonstration angles and dangles, high speed maneuvers in the ship control trainer. I would remind all parties, members of the court, and counsel for the court that we will defer asking questions during this morning session until we get back into the courtroom this afternoon. If you would please let CAPT Kyle lead the discussion this morning. Over to you, sir.

CAPT KYLE: Thank you. Ladies and gentlemen, I'd like to first orient you to as to where you're standing. This room is a rough replication of the attack center portion of a U.S. nuclear submarine. This equipment that's in here is tactical equipment. The equipment that these gentle--these petty officers are sitting at is tactical equipment. There's no resemblance necessarily to USS GREENEVILLE. It is equipment that is aboard submarines of our Fleet. This periscope is a periscope simulator,

it is not an actual periscope, it has video display at the top like a little TV camera. And we'll give you a demonstration on that--a Sea State demonstration on that later on in the demonstration. This is--this is where the problem is solved and the attack procedure is conducted. We train submarine crews in this room.

Step down the hallway and I'll orient you to the trainer and we'll wind up in the Sonar Room, and we will start the demonstration in that location.

This room here is where we--I'm sorry--this is the room where we set up the problems and control the simulation. And my thought today was to do basically two simulations for you. One at a fairly distant contact, 15 to 20,000 yards and then one closer in because they--inside 5,000 yards because they look distinctly different on the displays that we have and I want to show you the difference between them. And I'll get you oriented to the long range contact and then show you a close scene contact. I have not pre-briefed any of those watchstanders out there on what the scenario is gonna be. In fact, I'd like for someone in the court to perhaps to pick a bearing, a course, the speed, the range. We're going to set them in right here in this room, they don't know what it is. And to just show you that this not pre-staged these are operators going through an unknown problem to them. They just know it's going to be a broad band contact out there for tracking. So, if somebody would like to----

CC: Tom, you just go ahead and pick scenario.

CAPT KYLE: Okay, bearing three-zero-zero, range 16,000 yards, course two-seven-zero, speed 8 knots.

Petty Officer Hamilton: I have 16,000 yards, bearing three-zero-zero, course of 270, and a speed of 8 knots.

CC: Can I get your name, please?

Petty Officer Hamilton: Petty Officer Hamilton.

CC: Thank you.

CAPT KYLE: Okay, we'll walk down to the Sonar Room and I'll orient you to that area first.

CC: We are now moving to the Sonar Room.

CAPT KYLE: Okay, ladies and gentleman, this is a typical Sonar Room on a nuclear--on a U.S. nuclear attack submarine. It does not necessarily replicate USS GREENEVILLE, but it is typical of what GREENEVILLE has. What you're seeing is two displays of the ship's spherical ray, our primary search sonar system, it is basically a sphere. It's centered at about

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Good center frequency for detect--general detection of contacts in general out in the ocean, submarines to surface ships to large ships to small ships. It is spherical in design and the display replicates that spherical design in a manner I'm gonna try to explain to you here. You see essentially eight vertical columns, each of which represent--have a zero--a full azimuth coverage from south to south. Each of these columns has a south to south azimuth.

CR: May I ask you what unit you're pointing to?

CAPT KYLE: I'm pointing at the broadband display. Right now this little carrot above the end indicates that the ship's heading is on course North. This line here indicates where the stern is on the submarine.

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So--and this top display is integrating rapidly, you can see short contacts, transient, short duration contacts. You can see it on here but will never integrate on these long range--long integration periods. The long

integration periods on the other hand are good to look at contacts overall drift over time. Where they've been and where are they going. And so we have three integration's that are used by the operators to analyze the contacts.

I must point out, ladies and gentleman, that all this sonar system can do in a passive mode is track in bearing. Now there are some clues, which I'll get into as we go into as we go into the scenario itself that will give you clues as to target speed and perhaps target's depth--target's range. But in general this sonar system is designed to track the contact bearing. Acquire the contact. Put a tracker on it, which tracks the target in bearing only. The analysis of course, speed, range and so forth happens out in the Control Room, which we'll go see in the second phase of this demonstration.

Own ship's course is on zero-zero-zero it's listed right here on this display. Speed is 10 knots. A display on this stern curser--we just started getting a contact. The stern curser marks where the stern is. The sonar system cannot hear directly behind where the ship is. It can't listen behind. And that indicates the key to the operators as to where the stern is where they can't hear.

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It's just a line--a bright line. The process being used is this operator sees it with his eyes. He'll scan across there with a cursor and listen to that noise level and he'll say, "That's a contact". He'll report to the supervisor back here and he'll say, "I've got a new contact", and he'll make--the supervisor will make that report to the Officer of the Deck on the Control Room.

At the same time he'll be assigning a tracker, this little letter here Alpha 1, Foxtrot 1. He assigns really two trackers to it. He assigns Foxtrot 1 with a contact. Foxtrot 1 will now stay with that trace and follow it in bearing. And will send bearing 028.4, you can read it right up there, degrees true to the Fire Control System for analysis. The operator just is listening to the nature of the sound and he's able to classify it as a surface contact by the nature of it's sound. By the propellers and the way it's--the way he's trained to

listen to contacts. He has got the contact and auto-tracker following. The auto-tracker following it will track this thing automatically. It's now sending the sonar data from this place up to a classification function. We'll watch that process in just a moment.

Basically we're taking the data off of that tray and doing a detailed special analysis of that sound to see what he can determine in terms of speed of the contact. That's what he's trying to determine right here. The beat rate of his propeller will give you an idea of the contact speed.

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And while they're analyzing that you can look at this contact and see already that there is a left bearing drift on the contact. You cannot see it very well on the short term because it's not integrated data. But if you look in the long term you can see that the contact has a left slope to it. It is drawing to the left. It started at 028 and now it's 027. It's drawing to the left forward. But that's why we have different integration periods. You can kind of pick those things up by looking at the longer term as opposed to the short term integration.

Now these folks will do some mental calculations to come up with course, speed, and range in here, but the real processing goes in down the hall.

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By measuring that angle very precisely you can determine through trigonometry what the range to the target is. And that's why we have a spherical array.

In this case the contacts--all his noise is coming in the upper D/E's, the ones pointing up and there's really no--

this source of ranging is not currently available on this target.

I think we'll now move down the hall back to the--see how the contact management team is analyzing this contact. All the way through down to the--straight on down.

CC: Captain, what space is this?

CAPT KYLE: This is the Control Room.

CC: Okay.

CAPT KYLE: At this stage what--in submarine parlance we would say, "Sonar is tracking the contact, Alpha 2". And that's important--important to understand what that means. Sonar is tracking the contact means that basically he's got a tracker on there. Sonar has heard it. Assigned a tracker. And the tracker is following the target in azimuth--in bearing. And they are trying, in sonar, to exploit as much information as they can from that sonar signal. Maybe range. Maybe its speed. And that's passed on the phones into these folks here to help determine what the target solution is through analysis.

What we're going to demonstrate for you today is classic, passive sonar analysis. Passive ranging techniques. Target motion analysis done by some people who are trained to do this. We have an Officer of the Deck who drives the boat. He has his lieutenant behind RADM Sullivan here. He is going to be driving the ship to optimize target motion analysis and range solution. The two operators on the console are trained operators. They know how to do--they've been trained to operate this equipment to--to come to an answer on course speeds, bearing range of this contact. I'll try to explain these consoles to you as best I can during this analysis.

I want to emphasize that this is not an automated process. It's a receive assisted process. It takes the operator's intuition, his own knowledge and training about the contact, information gained from sonar, plus trial and error to come to course, speed, bearing and range. After a couple of maneuvers aboard ship looking at the target from different aspects the number of possible solutions very quickly can go down to a very

limited number. And the solution will converge to the answer. And that's what we're here to demonstrate.

What he's looking at--those that want to see need to come as close as they can to these two consoles here. They both replicate the same kind of display. These little dots coming in here are bearings being sent to the fire control system by the sonar system. They are actual bearings coming in. This little diagram on the right hand side is what he's using to do some of his analysis. This little bottom stick indicates where our own ship is driving. This vertical line is the line between own ship and the target. In other words, the current bearing.

And, the little stick on this guy on the top contact is the trial course and speed of the target and his objective is to set a course, speed, bearing and range that causes the difference between the generated bearing by that course, speed, bearing and range to match what the sensor is sending it. So, if he picks a solution, course, speed, bearing and range is correct the bearing that is generated by that solution should match what the sensor has continued to send him. And that's what's displayed here. It's the difference between what the sensor is sending in and what his solution predicts the bearing should be, and as long as that's near zero in the center and straight he's got a pretty good answer.

On the first leg and the first leg means the first look aboard ship at the target, there are really an infinite number of possible answers that will straighten this back a dot and make it look good. You cannot come to a definitive answer with just passive bearings only on the target on one look at the contact--one maneuver. Only if you have something else definitive like a range or a speed that you're very confident in can you converge on a known answer right on the first leg.

In this case, this target is not giving us that information, so we need to get a good--good set of dots and how long that takes is probably 2 to 3 minutes depending on how strong the signal is. If the signal is weak and the sonar is hunting a little bit on this bearing it may take a little longer. If the signal is very strong, coming in well, good sound conditions it may take a little less. But on average 3 minutes is a good thumb rule. It could take a little less, it could take a

little longer to get a good string of dots to make an analysis.

This display over here is a helpful display and it shows every dot coming in and what bearing it's in, and he can actually measure the bearing range of the target used in this little stick right here to make an adjustment. He can actually refine mid to the bearing very accurately so he can use that in trying to figure out his solution.

Okay, the Officer of the Deck has just chosen another course. He is taking--he is going to look at this target from another aspect. He is taking him--the first leg we were looking at the ship off the star-board side of our ship. He is now turning the course to one-three-zero. He is going to be looking at the ship off the port side of own ship. By changing our speed relative to him as much as possible from right to left it helps these operators converge to a solution faster. The algorithms--the bearings change faster that way. And it's by changing the bearing that we come to the conclusion there's only one-fifth that will solve--that will fit all those bearings--that bearing change, course, speed, bearing and range. And that's what he's doing. He's taking a course in the other direction at a fairly high speed which will cause the bearing rate to change on the target and now we'll define the solution here. We have to change course. If you look over here on this display we see we're two-eight-seven, turning to the left, right here at this area where this compass rose. We're turning to the left. We're going to steady on course one-three-zero. Really nothing can be done at this point until we get over there. Not much can--not much more analysis will be done until we get over to that one-three-zero-four. When the back end of the ship turns through the target we'll have to stop tracking for a few minutes because we can't track through the stern part of the ship.

This display over here is the auxiliary sonar display. At this display the Officer of the Deck can look at every display that's brought up in the Sonar Room. And we can see stern curser is moving toward the target indicating we can no longer track this target. It's fading out because the stern of the submarine is now pointing at the target.

In a few minutes as it continues to turn around he'll come out on the other side of the stern and we'll be able to track him again. Remember, we had the target initially at about 029. He has drawn left very slowly at 025. It's a very low bearing rate indicating by general analysis that this contact is fairly distant--could be distant and that the bearing rate is very low. That's sort of a gross mental picture that we are all trained to develop in the submarine schooling we go through to analyze contacts based on bearing rate changes.

The true proof of the pudding will come out when we come out when we come on this next leg and we watch the bearing rate on the second time. We really don't know. It's still ambiguous in everybody's mind until we get this second leg in. Second leg means--the leg terminology means the second look at the target from a different aspect.

Looking at where those bearings are coming out the Officer of the Deck decided to come a little bit further to the left to make sure he's clear of the area we can't hear behind. The area that's precluded by own ship's noise.

You can see that the contact is starting to come out of the edge of the no-hear zone basically. Sonar has reassigned the tracker. He has regained the target. He has reassigned a tracker and the information is now coming back out here for further analysis. Officer of the Deck will steady up on one-one-zero. Sonar system is continuing to send sonar data to fire control and they will begin their analysis on this second leg. The ship converged to a fairly good solution here if we get a good bearing rate. The contact is very distant. There's no bearing going to be on this leg either. That would indicate the contact quite a long distance away, 20 to 30,000 yards. If we see this contact starting to move left it could be quite a bit closer. You can see already he's starting to move left at a higher rate. As a ship driver I would look at that and say that contact is in the mid-range area. Just by--just inspection there I can already suspect that he is at 10 to 15,000 yards maybe in that zone. He's not real close but he's also not real far away either. He's in a mid-range area.

And so I'm doing this analysis in my head and I will use--I'll compare my mental analysis to what these operators come up with on--using the computers--the system. Make sure it all jives. You see the officer is also doing analysis on a console. He is also trained to do this same sort of computer assisted analysis. And they all work as a team to iterate this process into a solution. It's not a defined thing there's no--the machine does not come up with a definitive answer.

There is an algorithm running in the background that given the right conditions may help you in coming up with an answer. It's called KAST. It puts the data through a common filter and comes up with a suggested answer. These types of maneuvers with high speeds on one side in the other it's often pretty accurate. But it's not always. You have to look at it with a grain of thought--a salt and consider it as an input to your overall solution.

We'll let this generate a couple more minutes and then we'll take a look and see what KAST has for an answer. You see on this display we had a low bearing rate. Pretty much steady bearing coming up. But now the first few minutes of data here indicates the bearing rate has picked up a little higher. It's about left 4. Well that's good. This machine here will come up and by--there's a formula that comes into play here that helps us determine the range based on these two bearing rates. Range is displayed right here eight-eight-one-zero yards. It's an approximate range. It stays the time at two-zero-zero-eight. It's fixed at a particular time and the time in this spot it is now two-zero-zero-eight. So about the time now is when that range is estimated at 8,000 yards--1,800 yards. Then we use that data to help--to kind of zero in there at the 8,000 yard range and see if they can make something work. You see the dots are kind of spread out all over the place. That means that sonar is kind of hunting around a little bit. It takes a little bit longer time in those conditions to get a good leg. It may take a little longer than 3 minutes on this leg to get a good picture of what the target is doing. The displayed solution on here is at 9,700 yards, course two-four-seven, speed 9.6 knots. That's his best guess of the solution right now at this trial solution.

He can do three things with this. He can do--leave it as it is and continue to work the trial. He can more or less bookmark this solution for future reference by entering what is called entering mate. It kind of logs that solution and puts a little "T" on what his range is--where he thinks the range ought to be. It kind of gives him a picture of where he thought that solution was at one time. Or he could promote this to be the system solution which would be in a combat situation the solution would be to shoot weapons at. Or it's the system if we come to this--anybody comes back to this particular target on any screen will start with that solution. It's the archives solution of records. It updates the solution based on your findings. He pushes that button and updates system and now the system solution reflects what his best guess is right there.

Now control of that system solution depending on the tactical conditions on the ship varies at what level that decision is made to update system. It could be done on a transit watch where there's not much tactical issues. It could be done at the fire control operator level. In a more critical tactical situation it might be done at the Officer of the Deck level. At battle stations it's done by the XO who is in charge of coordinating this whole effect here. So that decision to update system is not one that is not without some thought who is authorized to make that decision.

This operator over here has a different answer. He is tracking at 8,900 yards, two-four-five, 10 knots. They are all coming to the same answer that two-four-something is the right answer and course speed is about 8 or 9 knots. The range is a little bit off yet. We don't know for sure what the range is.

You can see up here on the display contact is clearly drawing much stronger left on this leg than it did on the previous one and that is a big clue to us as to what contact's aspect is and a general idea where the contact's range is. Deck, take the contact across the line of sight one more time. If I take the carrot across the line of sight over to two-seven-zero you see that he'll drive own ship's heading across him and he'll get one more leg on the other side of his contact and by then he should have this contact pretty well locked up.

Now when you have a solution that the dots path is consistent across multiple legs we have zero bearing difference dots straight up the line the solution seems to be matching the sensor bearing. That terminology is submarine jargon is called the tracking solution. We now have a tracking solution. It's tracking through multiple legs. It's an iterative process we've now zeroed in on and we are comfortable that this solution is pretty accurate because it continues to follow the sensor. This is getting close to being a tracking solution. This would be what I would call a fair solution at this point. Almost to the point where ya know I would--if this was a combat situation I would be willing to expend a torpedo against this target right now and think I would get a pretty good chance of getting a hit. A pretty good solution at two legs.

CC: Okay. I'm satisfied with this do you want to go onto the next demonstration?

CAPT KYLE: Okay. What I'd like to do, Admiral, is just put in a closer in--get it a little more abbreviated. And get you an idea of what a close-in target looks like on the sonar display. And I'll go set that up. I'll just go set it up in the room there. I'll be right back.

They are in the middle of setting up the new contact right now. We dropped that contact. You see he disappeared off the screen there. The first contact. We'll bring in a close-in contact which I think you'll see looks quite a bit different on the sonar display. You'll get indicators right off the bat that I'll show you that the contact is closer than this other contact was. It will be just a minute while we enter the data in our computer there.

Okay. I'm getting a new contact. That's a standard report you just heard from the Sonar to the Control Room. This is how the sonar in the GREENEVILLE comes out of the little cubbyhole out there and everybody in control can hear that new contact. It's being picked up at three-zero-zero and they've assigned a tracker to it again. Logged it on one-three-zero-zero

CC: Tom, to establish a problem would you put it into the computer?

CAPT KYLE: I set a contact at three-zero-zero, course one-two-five, range 6.5000 yards--6,500 yards. The--I think it was 8 knots--7 or 8 knots. I can't remember.

CC: Thank you.

CAPT KYLE: Own ship is still on course two-seven-zero, 10 knots. So the contact is off on the starboard bow. And if you think the setup is kind of driving at own ship at this point. A little bit over 1 minute of data coming in and I can already see on this intermediate display that the contact is drawing right. And that right off the bat you see a high bearing rate. On the initial leg like that it automatically sets up your alerts that this contact may be close.

We're going to look over here at the time bearing display and see that the contact is drawing right. It's got a weak track. It's not very loud. We've got to wait a few minutes to make sure the sonar is getting a good track. The bearing rate is not as strong as it looked at first. So it looks okay. It looks--the initial reaction was close but I would say based on that right now it doesn't look as close it seemed at first. Okay. Maneuver the ship to zero-three-zero.

The process remains the same. He's on the right side of the ship now. The next maneuver a classic TMA would be to take him over onto port side of the ship and look at it from the other side. On this display you can kind of look how long you've been tracking the contact. You see 2 minutes here. That's 8. That's 4, 6, 8. It's 2 minutes per tick mark there and you can kind of keep track of how long you've been tracking the contact.

The faster own ship drives the quicker we resolve the solution because we will start driving the bearing rate ourselves. The more we can change bearing and bearing rate the faster we'll come to an answer. So the Officer of the Deck asked me permission to increase ship speed and I certainly agree with that. That will help us with the turn and also help us with the analysis.

Let me point out on the back wall here of Control while we're waiting for this contact to generate. This Petty Officer right here is maintaining the Contact Evaluation Plot. Once he gets done with his plotting here I'll

describe it to you. Basically, it's a replication of the data that's in the fire control system over a long term history. And it's a plotted--plotted version so you can--and it's large letters so you can see it from across the Control Room.

Here's plot Sierra 2, which is the contact we tracked in the first phase. It also has indications were own ship has been. This is own ship's heading over time. He keeps that up-to-date. He'll also log on here anything else he hears about the contact. For instance, sonar might say that he's at estimated speed of 6 knots or 7 knots. He will put that on here. It's sort of a chronological record or scroll, if you will, for contact information. All the information that's going on in the Control Room regarding contacts. And you can see overall at last leg it was a zero bearing leg. We maneuvered and then it took off to the left. And from general overall analysis looking from across the room you can say that that contact is a medium range contact. Bearing was not real high. It didn't break way over here. For a close-in contact it was a moderate bearing rate. A fairly mid-range type of contact.

This plot is maintained pretty much continuously when the ship is underway. In a heavy combattal stations condition there would be a dedicated plotter here. On a normal transit steaming it could be maintained by the fire control operator. On the ship itself, it's not posted on this back wall. It's a little bit out of position. It's normally closer to where these operators are sitting.

You can see this contact is now definitely bearing to the left--drawing to the left. Much stronger and much more response to own ship's maneuver. You look on this long term history you can see that it's really hooking left indicating the contact is pretty close.

Bearing rate on the bearing rate measurement display over here is Left 7. That's pretty high. If the submarine plots get a contact that's Left 7, Left 8, somewhere in that area everybody in here would understand that that's a pretty close contact. That's within 5,000 yards. And our 5,000 yards is sort of the demarcation between mid-range to close-in, some contact that you would have to be of concern--definite concern that he's pretty close.

He's in a position where he can maneuver and be very close aboard in a very short period of time. We do not like generally to drive underneath other ships, it's just not a good practice especially if they're a trawler or something that's dragging gear behind them. We try to avoid coming in too close to any contact. And we try to remain outside 4,000 yards. The solution they have right now, 3,700 yards, 7.3 knots, and a course of one-two-seven. It's a pretty good solution. Two quick legs. Because the bearing rates are high there is only one set of fits that goes through there and they come to a conclusion much faster than on the last problem encountered.

KAST solution has this automated system in the background. It helps the operator with high bearing rate situations. It comes to a pretty good answer most of the time. It has bearing two-seven, at 3,400 yards, one-one-seven--seven knots. That's a fairly good solution. High bearing rate. Large speeds across the line of sight. It comes to a pretty good solution. That helps the operator. Return to your normal display. The KAST handler range here is 4,200 yards. A very quick answer.

CC: CAPT KYLE, I'm satisfied with this.

PRES: Are the parties satisfied? Are the counsel for the parties satisfied with the demonstration?

Counsel for CDR Waddle, party: Yes.

Counsel for LCDR Pfeifer, party: Yes, sir.

Counsel for LTJG Coen, party: Yes, thank you.

CAPT KYLE: What I'd like to do now, Admiral, is take the ship to periscope depth and we'll take a look at this contact on the periscope.

Okay. In the interest of time we have just done an analysis on the one and only contact. The Officer of the Deck is going to take the ship to periscope depth and show you the standard procedure for going up. Just wait a second, Lieutenant. And in the normal situation he would have done a 120 degree baffle clear across the stern port--stern portion of the ship. Remember that

we--we cannot listen behind us, so we have to turn the ship far enough to make sure there's no contacts behind us that we're not tracking. We just did a fairly substantial course change as part of this test--of this analysis here but it's not 120 degrees. We would have to do a greater course change. But in the interest of time, so we're not just standing here watching grass grow on the screens, here we'll just go up periscope depth and show you the process going up there and then you'll get your chance to look at this contact out the periscope.

You would come to one-five-zero feet. The first step is to bring the ship up above most sonic layers, most sonic layers are deeper than that. And the concept is to get up to a mid--where you're not in jeopardy of being struck by a deep draft merchant, but shallow enough that you can hear above the sonic layer and not be--have contacts shadowed by strange bending of the sound waves. That's always--generally our point of departure is one-five-zero feet. If we have--if we know there's a sonic layer that's shallower than that we may start--we may start our depth--our preparations at one-five-zero feet and then go up to one-two-zero feet.

The Officer of the Deck just now announced to all his stations that we're making preparations to go to periscope depth. This is a big deal for us. It's an area where everybody gets heightened awareness. It kind of gets their game face on--pays attention to what they're doing because it's a time of jeopardy. We're going up to the interface. We want to make sure there's no contacts close aboard that we could have a collision with. So everybody is--they have certain procedures they go through in Sonar. They start listening around the baffles. They put on--they're really hunting for contacts. And they change their display surfaces to make sure they are in an optimum line up for going to periscope depth. Listening upward for contacts nearby. The console operators all recognize they are going to periscope depth. The ESM sensor, radio people who are not attached--not really part of this attack center, but on a ship they would also be briefed and they'd be checking their stations to go to periscope depth as well. That announcement is very important.

In general, a brief would be conducted with all the principle stand--watchstanders of what's planned for

periscope depth, what are the conditions they expect to go up there, what evolution is to be conducted while at periscope depth.

Again, in the interest of time we're not going through that full briefing process but that would be the standard procedure. As soon as you're ready, Officer of the Deck, proceed to periscope depth. He's taking 7 knots to give him a good upward momentum to get to periscope depth. Officer of the Deck, sea state is Sea State 4. As he proceeds to periscope depth he will lower his speed so when his scope breaks--breaks the surface it doesn't put a big feather up there, but he'll use that speed and I'll explain to the ship control trainer why he puts that speed--another reason he puts his speed on is to give the ship good control on the way up. I'll explain that in a later demonstration.

A real periscope doesn't have that time delay. This is a trainer anomaly. There's a time delay from the switch up there that simulates the scope coming up the well. This one obviously doesn't go down in a well here. It's a training facility. He's looking straight ahead and looking up at the top of the surface of the water looking for hull shapes. He is allowed to turn basically back and forth about 30 degrees. He is now at periscope depth. There's a little television monitor over there. You can look at what he's seeing. He just got a wave hit.

The graphics in this trainer are fairly old. They're all '80s technology type graphics. We're in the process of updating them but it does give you the impression of sea state. It does train the operators on scope wash and so forth, the difficulties of having waves hit your scope. He's trying to do three looks in low power to check for low close contacts. That's now the contact that he was tracking and now we'll conduct an observation.

And I think we'll stop the demonstration at that point and let the--let those who want to look out the periscope get an idea of what the sea state looks like against this small contact out here. Any of the court members who would like to go up and you can kind of see what's in the screen there. But if you get an idea of what the--of

putting your eyeball up to the optics. I'm going to leave it--we're at five-six feet. I'm going to come up to five-two feet. Officer of the Deck, come to five-two feet.

CR: The President is now taking a look through the periscope. RADM Stone is now taking a look in the periscope.

CAPT KYLE: TOC, what's the range for the contact? It's 4,000 yards away.

CC: RADM Sullivan is now taking a look in the periscope.

CAPT KYLE: We come down to 5--I'm going to come down to five-six feet. Five-six feet we start getting wave hit again at sea state 4 and contact comes in and out of display depending on what depth you're at. Okay, we're finished with this demonstration. Is the court satisfied, sir?

[Affirmative response.]

[The Court then proceeded to the 688 Control Room simulator.]

CAPT KYLE: I would just like the court--we have a limitation of 10 personnel on the trainer itself so I think the--we could have everybody else to watch from back here. You can see most everything. You other folks should be able to hear everything that's going on and see the reaction of the trainer cab from where you're standing there. You can really get a good--

Ladies and gentleman, what we have here is the--you were just on GREENEVILLE this morning, we have the ship control portion of a 688 Control Room. We've got the Stern Planesman, Bow Planesman, the Diving Officer of the Watch, the Chief of the Watch over here, and Chief Payton here is the cab operator. He would not obviously be on the ship. He is a training person. And what we intend to do today is I'm going to act as the Officer of the Deck and give orders to the Helmsman here and drive the ship at some angles, make some high speed turns and we'll go to periscope depth, do the emergency deep and emergency blow. Again I'm going to abbreviate the periscope depth procedure. I'll just talk through that.

We'll go through that fairly quickly because there's no contact analysis equipment here we'll just go--pause at one-five-zero feet and go up to periscope depth fairly quickly. Okay. Are you ready to start?

LT VAN WINKLE: Real quick. You need to keep your hands inside of the cab away from the fan.

CAPT KYLE: The cab actually rotates. It's on hydraulic pistons. So you need to keep your arms and legs inside the windows please.

Watchstander: Okay. We're currently at one-five-zero feet. All ahead two-thirds. We're ready to operate.

CAPT KYLE: Okay. I'm just going to hone you into the displays we have. This is a shallow water depth gauge. We're at one-five-zero feet so it's cut in. It has a maximum range of 200 feet. Deep water depth gauge goes down to 2,000 feet. Own ship's compass rose heading. These are the bow plane indicators. It shows you what angle the bow planes are at. The stern plane indicators. The rudder indicator. This indicates the overall jump speed that the ship is in at two-thirds. That indicator there shows the speed the ship is actually making is one-zero knots.

We have an angle--pitch angle indicator at each station. Here this is an electronic determine pitch angle. There's also a mechanical bubble right in front of the Planesman right here. Also a fathometer on the bulkhead on this side over here. To look at the angle of the ship as it's speeding through water.

The Ballast Control Station actually compensates the ship. It tries to keep it at a neutral trim at all times. He also is the person that initiates emergency surface at those stations that he's pointing to right now. And he's also works with the Chief of the Watch in keeping the ship in a neutral condition. Each Planesman has his own set of indications that he looks at right in front of him but he is trained to scan all indications to make sure there's no errors being developed in any of the indications.

There is also one other depth indicator here. It's the digital depth gauge. We train everybody not to rely on

any one particular depth source because any one of them could fail at any time, and depth is obviously very important to us on a submarine.

I'm going to increase speed here. We'll do some angles and then we'll do some turns and then go to periscope depth. Diving Officer, make your depth 400 feet. He just put the bow planes in dive and put the stern planes in dive and he ordered a down angle--a pitch angle down to drive the ship down to 400 feet. Sea state is 4. All ahead full. Very well. The faster we go the more weight the ship can carry. So if we go to periscope depth--we always try to slow down to 5 knots and assess what our trim is because we can carry a lot of weight at high speeds and we don't really recognize it.

We need the ship to have a no trim condition before we go up to periscope depth. We're going at 20 knots. We'll kind of mask the Diving Officer's ability to assess the trim of the ship because it carries so much weight with hydraulic forces on the planes. Own ship's speed is now approaching 20 knots. We're leveling out with the ship under control here at 400 feet. Diving Officer, make that six-five-zero feet. 15 down. He is going to use the bow planes to kind of push the boat down first and he'll see if--take the bow planes off first. The stern planes will exceed the water's 15 degree down angle. And then he'll control the angle at 15 down until he approaches six-five-zero feet ordered down. The stern-planes are now coming up. They'll rest down where--as the ship is going down there's a hydraulic force on the sail which tends to cause the ship to get an upward pitch angle.

So, going down you can afford to take the angle off a little later because the ship naturally tends to go back toward zero from a down angle. Going up it's just the opposite. You can take the angle up a little more aggressively because the sail tends to keep an upward angle on the ship longer. The Diving Officer can't accomplish this. There's no fixed--it's a training issue. They have to learn when to take the angles off and pull out. It's sort of a pride factor on how close they can hit it without overshooting or undershooting it.

It's the same process in reverse. First, you'd use both planes to get the ship moving in an upward direction.

You would take the bow planes off first then the stern planes to control the angle at 15. See he had to take-- and you notice if you're watching he took the plane--took the rate off a lot earlier this time because he could use the planes to counteract the pitch because the sail has the ship pointed in the upper direction. Dive, make depth 700 feet and 20 down.

He just passed the word "ready for deep submerge". That's when we go past 650 feet and we put the ship at a more watertight safe condition. That's what that announcement means.

Control Party, as soon as we steady out we're going to just use the high-speed charts. 688 class submarine operates at high speed at a fairly high rudder as you no doubt saw in the dry dock and operating the rudder at high speed, large angles, requires a lot of coordination between the Planesmen to keep the ship on depth. Once the ship starts yielding you'll see it roll a little bit. The rudder starts acting as a diving plane as opposed to just the rudder.

[(b)(1)]

They have to counteract that effect.

PRES: What is that training piece?

CAPT KYLE: Steering wheel. Makes her high-speed turns.

PRES: Right.

CAPT KYLE: Left 15 degrees rudder, steady course one-eight-zero.

[(b)(1)]

You've got to remember that this is a 7,000 ton ship, 300 and some odd feet long. It's really turning at high speed using a

lot of its power to turn the ship around in a hurry. This is referred to as combat nuke. We don't usually drive this aggressively in normal underway.

This is what these indications are, CAPT Hayashio. You can hear it on the rudder area near CAPT Hayashio back there. The deeper you go the less calculation. Ahead two-thirds. Now let's make depth one-five-zero feet. We're going one-five-zero feet in preparation to go to periscope depth. Let's go down a little bit to get up to let him make sure it's the right heights and then we'll go up to periscope depth and be there for just a couple of seconds.

We'll do the emergency deep down 400 feet and then the emergency surface. At one-five-zero feet we normally do a baffle clear. We check our sonar areas that are baffled right now and a couple of course changes to make sure that we had the go ahead. Understand the contact picture for topside. Again there is no contact analysis equipment in this trainer so as soon as the Diving Officer is comfortable here we're going to go up to periscope depth. Right 15 degrees rudder. Steady course zero-five-zero. As the submarine approaches the interface the waves surface cause a low pressure area right between the hull of the surface causing the submarine to be sucked toward the surface. So in preparation to go periscope down in a heavy sea state and the Diving Officer already had been told expect a Sea State 4.

The sea is from the North. You'll bring on 10 to 15,000 pounds of water at minimum to help keep the ship down as it approaches the interface. He may--and he'll adjust that based on how fast we ascend to periscope depth based on his experience. And that's coordination between the himself and the Chief of the Watch to balance the pounds. He's already brought I--I believe he brought out how much 12,000? 24,000 pounds. And he has put a lot of it back in the aft of the crew tank to keep the back end of the ship down to prevent from being sucked up and broaching unexpectedly. Because he's carrying that extra weight you can see that the trainer is operating at an up angle. He's basically flying the boat upward keeping that--using that angle to compensate for the weight that's being displaced. The ship's intentionally out of trim at this point.

Are you ready to go to periscope depth? Alright, I want you to make depth six-zero feet. Same course. I'll keep the speed on to get him going up there. He needs that speed to carry that weight. If I take the speed off now he won't every make it up to periscope depth. So, I've got to kind of gauge my speed accordingly. All ahead one third. In the Control Room the only person that should be talking is the Diving Officer. He will be announcing the depth as they go up. No one else talks. This is a discipline we rigorously enforce. Periscope is up. I'm looking up at the surface at this point. I'm looking for hull shapes. Scopes under. Dive, let's make it five-six feet. I would probably be at this point at sea state 4. I would probably have some splash in the head window and have to come a little higher to see. "No close contacts".

When the Officer of the Deck announces, "No close contact," everybody can relax a little bit. Everybody is primed at that point that if somebody was seen close aboard the ship would have initiated an emergency procedure to get down to periscope depth in a hurry. So there are only two possible answers when you come up to periscope depth. There's either no close contacts or emergency deep and we would take the ship back down.

Now I'm going to execute that emergency down procedure just as a demonstration. Emergency deep! Go to a hundred feet. He goes to dive on the plane. He limits the angle so the propeller does not come out of the water. He orders ahead full to give it a lot of power to drive down to 150 feet. I've ordered today, 400 feet as--make it at 400 feet. Did you get all the flooded water out? See then he starts pumping that water back off again or you'll pull it right out of the water then you can't drive down. You want to moderately increase your angle on the boat. All ahead standard. Left 10 degrees rudder. Prepare to make turns to 12 knots. Very well. Very well. Helms, turn the mid-ships. Diving Officer, for this emergency drill we'll use a 10 second emergency blow with 20 degree up angle. Use the bow planes to get the boat to start to move up. Move both by planes to zero. Rudder the amid-ships. We'll achieve 20 degrees up on the stern planes. At this point, the boat is pretty much in a direct projecory to the surface. It is almost unstoppable. There is enough buoyancy that it would be

impossible to arrest the upward descent. It is coming up at a very high rate. That was the Admiral's question.

RADM GRIFFITHS: [Inaudible.]

CR: What was the question asked?

CAPT KYLE: The question was, could we have stopped the ascent after the blow was conducted. And essentially once that blow you are committed to the surface.

That concludes the demonstration of the Ship's Control Trainer. Do you guys see anything else to report?

PRES: Counsel for the parties? Parties?

Counsel for CDR Waddle, party: No, sir.

Counsel for LCDR Pfeifer, party: No, sir.

The court recessed at 1105 hours, 6 March 2001.

At Trial Service Office Pacific
Naval Station, Pearl Harbor, Hawaii
Tuesday, 6 March 2001

The court opened at 1301 hours.

All persons connected with the court who were present when the court adjourned were again present with the exception of the court reporter, LN2 Monica Wright, USN.

PRES: Let me just review a couple of things we did this morning for the court and then we'll get into procedural matters with the Counsel for the Parties and the court.

This morning counsel and the parties accompanied the members of the court to the USS GREENEVILLE and to the submarine simulators at the Training Facility Pacific. We did this primarily to better understand the evidence and gather the facts in the most thorough manner possible.

We thought it was best to visit the Control Room of the GREENEVILLE -- thought it would benefit the inquiry to experience the activity in the field of submarine operations -- also at the simulators.

So we reviewed the Ship's Control Room and RADM Griffiths described the duties of the Control Room, Sonar, and ESM watchstanders.

After that the court visited the simulators at the Naval Submarine Training Center Pacific, where we reviewed what I thought was pertinent procedures for the submerged and surface submarine operations.

Counsel for the Court, care to give the procedural matters?

CC: Yes sir. I would just like to briefly review for all parties, counsel, the exhibits that were entered into the record yesterday. You should all have copies of both the evidentiary exhibit list and the procedural exhibit list.

For the evidentiary list we have entered Exhibits 1 through 16 in the record. Those exhibits have been published to the members. With respect to the procedural

list, we have letters alpha through hotel and at this time, Mr. President, I would like to enter Exhibit India, which is the security debriefing acknowledgement form for Mr. Gittins.

CR: Exhibit India is being entered.

CC: Mr. President, we have also learned over the--the last evening what I would like to have Court Exhibit 8. LCDR Harrison, will you put Court Exhibit 8 up please?

[LCDR Harrison did as directed.]

AS you know Mr. President, as the investigation continues the people at SUBPAC, N72, have continued to look at the data--the information that is available from the GREENEVILLE concerning the collision on 9 February. They have since told us--and we intend to introduce this change through CAPT Tom Kyle, who should be testifying in the next day or so--that times associated on the left hand--the vertical axis if you will--of the diagram are off by one minute.

So, for example, starting at the top [referring to Exhibit 8] instead of time 1340 that should read 1339. Following down, 1338 that should be 1337 and so on. We will make that change through CAPT Kyle when he comes in to testify.

PRES: Make sure I'm clear. It's a one--minute----

CC: Yes, sir. It is a 1 minute change for each of the time entries there. Alright, sir. And sir, as they continue to refine the data, we may see more of these as the investigation unfolds, that there may be some changes like this. I wanted to raise that to the court's attention. Another----

ASST CC: Sir, if I may?

CC: Yes.

ASST CC: There is also a data point missing off that graph that we pointed out to the COB.

CC: Right. Right and that will be entered as I said, sir, through CAPT Kyle.

PRES: What it is -- make sure the members and the counsel know what the change was just like the time so when you reintroduce that and show us what the difference is, what the addition of the data point is.

CC: Just a request to party counsel that they remain seated when they conduct cross-examination. That's so that the microphone can pick up your voices. I say that's a request. It's a--the court will allow you to conduct cross-examination how you want, but there was a request from the interpreters that you speak more closely into the microphones. But I leave that--the court will leave that up to you.

And sir, finally, just to kind of map out the way ahead this afternoon, RADM Griffiths will soon retake the stand. What I would like to do is kind of map out for the court and counsel and the parties how we intend to proceed with RADM Griffiths.

I intend to ask him a few more questions related to the collision of the USS GREENEVILLE and the EHIME MARU, after which the members of the court will ask their questions related to the collision and we will get a little bit into the op area appropriateness.

Party counsel will then be given an opportunity to cross-examine on the collision and as we've discussed in the past, that is to give you an opportunity to really hone in on what is the single most important thing that we have been given to investigate before we move on to the other matters, for example, the search and rescue effort and SUBPAC's distinguished visitors embarkation program that we were given. This court was given the task to take a look at it.

So after you get done with cross-examination on the collision piece, we will come back and I will begin questions on the search and rescue on the distinguished visitors embark program with RADM Griffiths. The court will ask him questions and you'll be given an opportunity to cross-examine again at that time.

Sir, that's all that the Counsel for the Court has.

PRES: Any procedural matters from the Counsel for the Parties? Counsel for CDR Waddle?

Counsel for the CDR Waddle, party (Mr. Gittins): Sir, I would just--over--in the over night recess it came to my attention that if there is an unofficial transcript being circulated on the internet or on CNN. I've been told subsequent to the starting of this hearing today--or prior to the beginning of the hearing that that transcript was authorized by the Convening Authority.

I would just object to that--to that being permitted because it's inaccurate and in that sense misleading and it doesn't serve this court to have information that's not accurate being circulated as it was reported in a transcript when in fact it's not accurate and it's not complete.

PRES: My understanding is, isn't it characterized as an unofficial transcript?

Counsel for the CDR Waddle, party (Mr. Gittins): Yes, sir. And I think that's--to be charitable it would be an unofficial transcript, sir.

PRES: I wanted to make sure is--is the characterization that you saw on the internet----

Counsel for the CDR Waddle, party (Mr. Gittins): That is the characterization, sir.

PRES: That it's unofficial? Counsel for the Court, comments?

CC: Sir, again, that that is a matter within the providence of the Convening Authority. It was the Convening Authority, CINPACFLT, that decided that an unofficial transcript--transcriber would be allowed over in the PSD building where the remote video feed is going.

PRES: Well your objection is noted. We'll proceed. I'll raise this matter again with the Convening Authority--ask the question. I think we are going to continue to do that to make sure that this is clear--to make sure they understand directly from the parties--Counsel for the Parties--your concerned about that. So, we'll proceed, but we'll make sure that that information is passed to the Convening Authority.

Counsel for CDR Waddle, party (Mr. Gittins): Thank you sir. That was my intent.

PRES: Your welcome.

Counsel for LCDR Pfeifer, party (LCDR Stone): Sir, one other procedural matter.

PRES: Yes.

Counsel for LCDR Pfeifer, party (LCDR Stone): At last word we heard that the ruling was that LCDR Harrison wouldn't be in the courtroom for those areas which he would be subject to examination.

PRES: Yes.

Counsel for LCDR Pfeifer, party (LCDR Stone): We also heard that that matter would be brought up one more time with the Convening Authority. Just wondering if we heard anything or not?

CC: Yes, LCDR Stone, we have heard from the Convening Authority on that issue. I have not heard back from the Convening Authority on the IMC--the renewal of the individual military counsel request. ADM Fargo has reiterated that LCDR Harrison will remain on as an Assistant Counsel to the Court. However, as we made mention of yesterday, VADM Nathman, the president, has determined that LCDR Harrison will be excluded from the courtroom during those portions of the testimony that you may have when you were listening to Commodore Byus or to RADM Griffiths that relate to his involvement in the taking of statements.

PRES: Counsel for Mr. Coen?

Counsel for LTJG Coen, party (LCDR Filbert): Nothing, sir.

PRES: Okay. Alright.

CC: Sir, at this time we call RADM Griffiths to the stand.

Charles H. Griffiths, Junior, Rear Admiral, U.S. Navy, was recalled as a witness for the court, was reminded of his oath, and examined as follows:

REDIRECT EXAMINATION

Questions by Counsel for the Court:

Q. Admiral, when we left off and then took a recess yesterday, we were talking about the emergency deep and emergency surface evolutions. We went through that rather quickly and I would like to go back and just kind of walk through those two evolutions to make sure that we've got our timing right.

Do you know what time, sir, that the GREENEVILLE executed the emergency deep evolution?

A. Could I first ask for the laser pointer to be provided to me?

CC: Sir, we'll take a moment and go get those.

Counsel for the CDR Waddle, party (CDR Herold): Captain, can we have those provided to----

CC: Yes, we'll get them for everybody. While we are doing that, sir--we'll come back to those questions. Let me ask you a couple of questions about your testimony yesterday related to operations in Sonar.

Q. And, sir, yesterday your testimony was that we had a watchstander in sonar that was not qualified to stand the watch, is that correct?

A. There was a person at one of the two operable ship's BSY-1 sonar panels, who was in the seat where you would expect to see a qualified watchstander and he was not qualified, rather he was under instruction and he was using that opportunity to be trained to become qualified.

When that happens--and it happens all over, all of our submarines, in every watchstation, because invariably there are people trying to qualify--you have a qualified watchstander directly with that person, directly overseeing everything that they do so that they're actually meeting the requirements of the ship to operate.

And so when I say that there was an unqualified watchstander in Sonar, yes that is true. That's not necessarily bad because he was under instruction. The issue there was that he was not continually supervised by a qualified watchstander for that watchstation.

Q. Yes, sir. Sir, during your preliminary investigation were you able to determine whether there was a watchbill published that day?

A. By the time I completed my investigation I had not seen a watchbill per say, in the format one would expect if you walked down to the ship and asked to see the watchbill.

What I had instead was a compilation of who was at what watches, and who was assigned to what watch duties in total, as a summary for developing who should be interviewed and the like. So it actually was probably not the format the ship routinely would use to post a watchbill to the crew and assign watches, and to date I have not seen that format for a watchbill.

Q. Admiral, you would have expected to see one--to have seen one?

A. We asked for a watchbill as one of the items of data requested from the ship, and in the time that I conducted my investigation that was the only format that watchstanders were on watch that day were provided to me with and---

Questions by the President:

Q. Admiral, a follow-up question there. Can you talk a little bit how a watchbill is typically formulated for underway steaming? The Officer--excuse me, the XO typically signs the watchbill from my understanding. You may want to validate that fact, but he doesn't specifically go and parse individuals out of the crew for individual stations. He has support inside the watch organization and the watch and battle station bill about who will stand what watches. So can you go through that a little bit about how the watchbill is normally created?

A. Yes, sir. In my experience, the watchbill is created both for major evolutions that you anticipate you may need to man on a moments notice, such as battle stations or the maneuvering watch.

That is generally the tried and true watchstanders that the Captain has developed particular faith in for exercising those duties----when the chips are down. And they tend to be the varsity team. And then you have other qualified watchstanders who are not necessarily the most appropriate persons for that very special evolution, but would routinely stand that watch.

And you would expect to see the ship promulgate that watchstation bill in a rotational scheme where you have three section duty and every 6 hours a new watch section, section one, two, or three would take the watch when you are at sea for a sustained period of time. And they would all change watch in six hour increments and they would be also be assigned by name.

And then you have the unusual case where the ship is in a very short term evolution, such as a multi-hour underway for portions of a day as in the GREENEVILLE was doing on the 9th of February and in that case you would expect to see kind of a variation of that second theme, where you would have one primary watchstander stand a relief for each given watchstation. Perhaps a port and starboard routine would be appropriate or something like that for chow reliefs.

But generally it is one watch and then your moored again. So there would be kind of a modified version of the routine three section steaming watch for a one-day operation.

And with regard to who approves and signs that watchbill, I think it actually varies from ship to ship. In my experience I have seen both the CO or the XO be the most senior signature on that watchbill and I don't know which the case was for GREENEVILLE, but I have not seen that particular one-day watchbill for the GREENEVILLE other than the re-formatted and tabulated case, which also was all the other special assignments such as tour guide.

Q. Well I asked the question that goes back to the watchstander under instruction--that he was not assigned a qualified watch to be his instructor, and you would expect to see that typically designated on the watchbill. As I recall some ships use an asterisk, but there's some designation of the under instruction watch and there's the designation of the instructor for that under instruction watch. In addition to that you would see then a validation of who is under instruction typically brought up by the different operational sections of the ship, correct? So that I would suspect that you would see that if it was sonar watches--I'm not familiar with the submarine watchbill organizations--someone who had assigned that other than the formal approving authority. Someone would assign that particular watchstander to that station or assign the instructor. Do you know who that was or who that should be?

A. Sir, let me address your question as in two parts. The first of that is I agree with your assessment that the formal watchstander would be the watchstander that the watchbill would assign by the XO or the CO or whoever else placed the pedigree on that watch. And the under instruction or the trainee watchstanders under the wing of the qualified watches may be assigned by some lesser entity than the CO or XO.

I'm conjecturing here, because I didn't see the format the ship posted for that day and I still have not. However, you could look at what the ship did provide me when I did my investigation. And if you look on that tabulation--and it is one of the enclosures--you'll see that there was an additional qualified watchstander listed as Sonar Operator and he was a First Class Petty Officer--clearly experienced and qualified to be that second operator. However in the interview process, it came to light that he was, in his mind, he was assigned as a tour guide as his primary duty. And that did occasionally take him out of Sonar.

So, my recollection is a review of what was provided in writing would lead one to believe there was a qualified watch team that was full-up. But that investigation, through interviews, indicated that that may not have been the case. That probably was not the case.

Q. Was this senior watchstander who was qualified as Sonar Watch--that looked like he would be the supervisor--was he clearly designated as a tour guide then for the DV program?

A. Admiral, I don't remember. I don't remember what the tabulated list provided us listed him as, whether it was Sonar Operator or tour guide. I just don't recall, one of those two. I could review and determine it, but----

Questions by a court member (RADM Stone):

Q. Just a follow-up on that for clarification. Is there a requirement within the submarine community to have a watchbill submitted, reviewed, and approved for watchstanders prior to getting underway and sailing, and thus that document serves as the source document for determining whether or not replacing qualified people to critical watchstations? Is that a requirement?

A. Yes, sir. That is a requirement.

Q. And that's the document that you've not been able to see yet, is that correct?

A. That's correct.

MBR (RADM STONE): Thanks.

WIT: And if I could just add, I'm not sure if it exists. I just haven't found it yet--if it was inadvertently discarded after the shipboard or what the case is. I don't know and perhaps further testimony could investigate that.

Questions by Counsel for the Court:

Q. Admiral, during your investigation, were you able to determine the causal relationship between the unqualified--excuse me the unsupervised, under instruction watchstander and the collision itself?

So, for example, was the fact that he was unqualified -- did he miss something that he should have seen because he was under instruction and not properly supervised? That it contributed in some way to the collision?

Counsel for the CDR Waddle, party (Mr. Gittins):
Objection, calls for speculation.

CC: Military Rules of Evidence with respect to speculation do not apply at a Court of Inquiry, sir.

PRES: Okay.

Counsel for the CDR Waddle, party (Mr. Gittins): It is also a relevance objection. It's an opinion of this witness, perhaps, and not really particularly relevant to the court.

CC: Opinion evidence also comes in as the Military Rules of Evidence don't apply. With respect to relevance, it is relevant to find out--that's what we've been given by ADM Fargo to look at. What was the cause of the collision?

PRES: The objection is noted. You can answer the question RADM Griffiths.

WIT: Yes, sir. I was unable to determine if it had a direct bearing. I would be guessing and I have no ability to definitely tell whether the First Class Petty Officer happened to be over his shoulder at the moments that--for example, the target motion analysis prior to periscope depth was being performed or not. I was just not able to determine with fidelity whether that was the case and therefore I can't tell. Possibly, but I'm not sure.

Q. Sir, during your investigation--and we're going to shift out of Sonar and back into the Control Room. Could you define for the members what the PERIVIS is?

A. Yes. PERIVIS is the television recording system. It's a display and recording system--if you choose to record it--wherein what you look at through the periscope is also provided on T.V. monitors in the Control Room and wherever else the ship establishes them so that other watchstanders, in addition to the person looking through the periscope can have the advantage of that field of view when the television is energized, as it generally would be during daylight.

And there is an advantage to having more eyeballs look at the target, if you will.

Q. Was the PERIVIS operational on the afternoon of 9 February?

A. Yes it was operational.

Q. Sir, when GREENEVILLE came to periscope depth and during the periscope search that was conducted, did anyone else on the ship or in the Control Room see a contact on the PERIVIS?

A. I can find no evidence that anyone who was able to see the PERIVIS screens saw any object or contact that would be in contrast with the people looking through periscope seeing no contacts. In other words, no.

Q. Alright, sir. Now I would like to go back and talk about the emergency deep evolution. Can you tell us, sir, when the emergency deep evolution took place?

A. I believe that's a 0 behind the 4 and that would therefore be 1340 and 25 seconds local time as it indicated by the arrow, blue portion of the GREENEVILLE track here and--beg your pardon--that's 1340, that's 1342. Your question was when the emergency blow commenced.

Q. No, sir. When she commenced emergency deep.

A. Oh, I beg your pardon. Let me start over. 1340 local time is when she conducted the emergency deep for training.

Q. And sir, would you describe also for the court how she executed emergency deep?

A. The Captain was on the periscope. He announced emergency deep and commenced lowering the scope. He directed the Officer of the Deck to make his depth at 400 feet. The Officer of the Deck passed that command on to the Diving Officer.

The automatic actions at this point for the ships Control Party team would be to ring up ahead full on main propulsion; to take the rudder off the ship; and to use dive angle on the stern planes and the bow planes to attempt to quickly get the down angle to a specified amount for this class of ship. Which I estimate is 3 to 5 degrees down initially so that the screw isn't kicked out of the water to take propulsion off. This would start driving the ship down deeper. Additionally the Chief of the Watch at the Ballast Control Panel in Control would initiate action to bring seawater into a

depth control tank to make the ship heavier and to help it start momentum down.

I don't know what the limit is on how much the water he should flood into that tank. I'd be guessing at least 20,000 pounds of seawater to help the ship establish that downward momentum.

These actions would all be taken without further direction from anyone. They would be automatic actions. There's a slight modification here where the Captain had previously determined he wanted the ship turned to turn to a new course to the left at three-four-zero so he gave that instruction to the Officer of the Deck who would have passed that on to the Diving Officer and hence the Helmsman.

I don't know at what point that turn initiated, whether it was simultaneous with--right after emergency deep or if the CO had waited a little bit. But, at any rate the ship, shortly thereafter, turned to the left toward course three-four-zero and these were the summary of the main actions taken.

As the ship started to go down, the bell was reduced to a ahead standard because the ahead full bell drastically gives you a lot speed and more than the ship really wanted to have for very long in order to get down and get ready for the emergency blow.

Q. And how much time elapsed from the time she started her emergency deep to the time she--just before she executed emergency blow?

A. Well approximately 2 minutes and 25 seconds from the time that the emergency deep was conducted until the emergency blow was initiated.

Q. Is the time that elapsed between the time she executed emergency deep to the time that she started her emergency blow, is that significant in submarine operations?

A. It is significant. The ship would want to get below the surface and to emergency deep--or correction, would want to get below the surface and to the depth from which to execute the emergency blow and then execute the emergency blow in short order. Because during that period of time the surface contact picture can be

degrading and surface contacts can be coming in towards own ships position from over the horizon and become collision threats if you delay.

Q. So how well did GREENEVILLE perform the emergency deep and then the emergency blow?

A. I couldn't have done it better. I think they did an excellent job. They got down very quickly. And then conducted the emergency blow very quickly. So when they thought they had a clear surface picture they did a very good job of quickly executing the remainder of the procedure to get to the surface before that picture degraded.

Q. Admiral, once GREENEVILLE executed emergency blow, how much control does the crew have over the submarine?

A. Once the air is put into the ballast tanks it's literally impossible to stop the upward momentum from taking the ship to the surface. The law of physics apply here. There is so much positive buoyancy added to the submarines state of buoyancy that it is going to rapidly go to the surface. The ship's propulsion would also aid in reducing that time as it drives up, but the air will quickly get you there even without propulsion.

Q. Admiral, were you able to determine from your investigation where the distinguished visitors were when GREENEVILLE executed the emergency blow?

A. I can say with certainty only where three of them were. One was in the Helmsman seat--the inboard diving station controlling the rudder which was essentially left in the amidships positions at the point of the emergency blow. And, one was near the Ballast Control Panel in a position to reach up and operate the emergency blow handles under direct supervision of the Chief of the Watch. I might add both these visitors were under direct supervision from the qualified watchstanders.

Q. And, sir, we are going to put up the top view of the Control Room in Sonar again. LCDR Harrison, if you would raise the lights please. Admiral, if you would use your laser pointer and point out to the members of the court where in the Control Room the three distinguished visitors were.

A. Certainly, [pointing to the Exhibit 6]. The first of the three would be here in the Helmsman seat with the Helmsman standing over his shoulder and directly supervising his operation of the helm. It was essentially in a dormant state because they were in a rudder amidships during the emergency blow.

Q. Sir, would you describe when you say "directly supervising", what do you mean by that?

A. Yes. I mean that the person--if I could just stand here and demonstrate [witness stood]. If this is the control stick with the hand wheels on it that control the rudder, and the person seated has their hand here. The person would be standing over their shoulder with their hands essentially on the hands of the guests on the wheel, if required, so that there could literally be no movement of the yoke or the wheel without the person that was qualified agreeing with that movement.

Q. And, Admiral, you are describing exactly what occurred on GREENEVILLE on the 9th of February, correct?

A. To the best that I can determine that is correct. It's only indirect through interviews that I was able to come to that judgment.

Q. Sir, would you continue on. You mentioned that one of the distinguished visitors was in the Helmsman spot. But you mentioned that three actually had their hands on controls. Can you continue to describe the other two?

A. A second distinguished visitor stood in approximately the location where I am showing the laser pointer here. [pointing laser at exhibit], because the ship has a diving alarm klaxon there and this is the device that makes the "ooooga" noise--and in an emergency surface the ship would sound that three distinct times, "ooooga", "ooooga", "ooooga", and that would be the signal to the entire ship that the ship is conducting an emergency surface with the emergency ballast tank blow. And I believe that was a female distinguished visitor. And that's based on news reports.

And then third, there was a distinguished visitor who put his hands on the emergency ballast tank blow valves. And there are two valves where I'm showing the laser light now [pointing laser at exhibit] somewhat in the overhead and above the forward port corner of Control--above the Ballast Control Panel there. And again the Chief of the Watch--the qualified Chief of the Watch--the senior enlisted watchstander here had his on the hands of the guest and used a counting technique so that they were both actuated simultaneously for 10 seconds and then shut again. And, these two valves would send the high-pressure air into the main ballast tanks, forward and aft and cause the ship to do the emergency surface.

Question by the President:

Q. RADM Griffiths, a quick follow-up on that. These switches are similar in a sense like a light switch. They are either on or off. You are not metering air are you with a displacement of these switches? The switch is either on to start putting air into the ballast tanks or the switches are off? Is that correct?

A. They are either open or shut. They are valves. They are actually not switches. So they are pneumatic vice electrical. But when you move them 90 degrees they go to full open and when you take them off that position they go to full shut. So they are not affective throttling valves. They are either open or shut and they have detente positions to lock them into shut.

Now those are the three people that I know exactly where they were. There were 13 other civilian visitors and one military visitor. I know where the military visitor was during this period based on interviewing him and that's CAPT Brandhuber. And he was standing in this region of the Control Room, [pointing laser at exhibit] the after port corner basically trying to give the civilian visitors a better vantage point by staying back out of there way. And it was crowded so he was trying to stay out of the way of everybody, the watchstanders as well.

And then the other 13 civilian guests, as I understand it from interviews, were in the region as I am showing here [pointing laser at exhibit] outlining with my laser light, generally in the L-shaped white space starboard and forward of the Conning tower--Conning station--here

and then additionally some in this region here [pointing laser at exhibit]. And I say that based on interviews, and also know logically there aren't many other places they could.

Questions by Counsel for the Court:

Q. Admiral are you sure that all 16 of the civilian guests were in the Control Room?

A. No, I'm not. I'm sure though that almost all were as a minimum. Based on interviews--I asked that question of a number of people, and from the interviews there may have been a few--one or two, for example, who, either because they were ill from sea sickness previously or were distracted or talking to someone they may not have been in Control. But from the interviews, essentially they were all in Control.

Q. Admiral, in your opinion--and I want you to speak specifically about the three civilians that you mentioned earlier were on the controls--did they have any impact on the emergency blow or the collision with the EHIME MARU?

A. My professional judgment is that they had zero impact on that collision. They were merely acting under the direction of the watchstanders and physically doing what they were told and doing so in a non-disruptive way and completely cooperatively, and I believe that in this case they had zero impact.

Q. Sir, in your opinion do you believe that the GREENEVILLE properly supervised these civilian visitors that were on the controls?

A. Absolutely do.

Question by a court member (RADM Sullivan):

Q. Admiral, I had one question. After the emergency deep, did the ship try to re-ballast while they were deep--to pump off the water that they took on to conduct an emergency deep?

A. RADM Sullivan, I don't know. The length of time they were down would have made that an incomplete evolution at best, had they started it. And they may have assumed they would just do that when they were surface trimming after the surface, but I don't know the answer to your question because I did not have a chance to find out.

Questions by the President:

Q. Admiral, was the emergency blow a planned evolution or do you see any evidence of its--was there evolutions the ship intended to conduct that day and it concluded with an emergency blow and then apparently a transit back to the buoy?

A. Yes, sir. It was a planned evolution. It was in the Plan of the Day. Through interviews, I was able to determine at one point the ship considered not doing it perhaps because of--and I can only conjecture why--but then they decided they would complete this and carried it out as scheduled except for the time.

Q. Okay. RADM Ozawa and I are--both share this concern. Who ordered the emergency blow? Was it the Commanding Officer or the Officer of the Deck? Who initiated the command?

A. The Commanding Officer ordered the Officer of the Deck to initiate the emergency blow to the best that I can determine. And I might add throughout that hour prior to the collision the Commanding Officer used the Officer of the Deck to give the appropriate orders on the Helm and did not take the Conn, if you will, from the Officer of the Deck and give orders directly to the Helm. The Officer of the Deck used--was being directed by the Captain and then the Officer of the Deck would cause the events to happen. So, he was the intermediary as you would normally expect.

Q. And part of that sequence the ballast tanks are blown with air and then that 10 second interval is a measure of the amount of air that you want to come into those ballast tanks to displace a certain amount of water--I think is the physics of it. Does that 10 second blow--is that irretrievable in the sense that the ship is going to surface regardless of what--the intent is to surface obviously with an emergency surface, but is it irretrievable in a sense that the ship can't do much about it because of the buoyancy differences that exist at that time?

A. Yes, sir. It's irretrievable. Once you put 10 seconds of an emergency ballast blow into the ballast tanks you are going to surface, period. That's a lot of air.

Questions by a court member (RADM Stone):

Q. Admiral, at 1340 when the ship went to emergency deep and commenced that turn to three-four-zero until it started its emergency blow about 2 1/2 minutes later, what speed was the submarine at for that roughly 2 1/2 minutes?

A. My recollection is they were somewhere between 10 and 14 knots. That's the range and I can't give an exact answer without study. I could study the records, but somewhere between an ahead two-thirds and an ahead standard bell, which are the parameters that you would use to do this type of emergency blow for training.

Q. Was the sole purpose for coming around to the three-four-zero course to facilitate a quicker return to Pearl Harbor or did it have something to do with the evolutions being conducted?

A. Admiral, it would have to do with a quicker return course to Pearl Harbor. I think the ship had determined that it was a neutral event with regard to the contact situation to go in any direction based on their understanding of the contact picture. So, because it made no difference on contacts, it made sense to head towards the barn while you had that speed on.

MBR (RADM STONE): Thank you.

Questions by Counsel for the Court:

Q. Admiral, as part of your investigation, did you have an opportunity to examine the appropriateness of the OPAREA assigned to GREENEVILLE on the 9th of February?

A. I did.

CC: LCDR Harrison. I'd like to have this chart marked as Court Exhibit 17.

CR: [Marking exhibit.] This will be marked as Court Exhibit 17.

Q. Admiral, do you recognize Exhibit 17?

A. Yes, I do.

CC: LCDR Harrison, if you would put it up on the ledge.

[LCDR Harrison did as directed.]

Q. Sir, can you describe for the court what this is?

A. This is a chart--a nautical chart of the Hawaiian Island environs that shows several of the islands, including the Island of Oahu in the upper left here [pointing laser at exhibit]. And in the red boarder here [pointing laser at exhibit] you see a outline of a portion of a area assigned to the USS GREENEVILLE for the 9th of February surface to test depth submerged for her to use in a manner that she would not have to worry about sharing those waters with other submerged submarines.

Q. Why was she assigned such a large area?

A. She was generally assigned this area because of convenience. Certainly, she did not need such a large area, but nor did any other submarine. So it's a common practice to just give general large blocks of area to submarines and not encumber them with having to worry about close boundaries when no other submarines have any legitimate use for that water. So it's somewhat of an administrative facility to do this.

Questions by the President:

Q. RADM Griffith, how would other mariners, particularly the Captain of the EHIME MARU know about the operational area? Would it be a concern to him that there was a submarine operating area designated by SUBPAC?

A. Admiral, we do not promulgate to the common party public national or international the operating locations of our submarines in general. First of all, it's the bounded duty of the submarines as the burden vessel to remain clear of the surface shipping and to operate safely. And secondly, we have in addition to the rest of the Navy, a vested interest in having freedom of the seas and not being restricted to areas that would cause our military capabilities to be curtailed.

Basically the surface ships should not have to worry about our submarines, because we should always operate in a way that does not in any way endanger the safety of those surface ships, including their appendages such as fishing trolls and nets and anything they may put in the water for commercial use.

So because we have this burden of remaining clear and we have this need to freely operate on the high seas, we

have chosen not to come under a regime as a Navy policy where we promulgate our operating positions.

Q. Do you know how long that operating area has been described by that box?

A. Well that box is actually part of a much larger grid system that completely surrounds the Hawaiian Islands. It's just a subset of that grid system. And it would have been assigned for the very specific time the ship was underway. A day or less.

Q. Okay. Well let's look at the perimeter then of that area that is to the North that approaches the islands themselves. Has that perimeter been there in existence for some time? You described earlier that typically if you had no other conflicts with another submarine, typically, the submarine would be getting the leeway to use most of that operating area. So typically were submarines given the perimeters to the North and to the-- that surrounds the Northern part of that operating area.

A. Let me see if I'm following you, Admiral. This is a daily assignment. And this particular day--each day is different, this water was not needed for any other submarine so this just happened to be a convenient way to set the grid up, such that it ended very close to Oahu for the convenience of a short trip.

That particular day, other submarines may have well had waters contiguous to this boundary and been operating in their own assigned submerged areas. Each day is different as they rotate through their missions. Does that answer that?

Q. It does. When you build that operating area does it consider the density of surface traffic or changes in the density of surface traffic? In other words, over a period of years that it was created--and I assume its been there for some time--and if you could tell me how long it has been there it would be great--but is there ever modifications made to this knowing that you will conduct some operations including going to periscope depth? So are there considerations made in the assignment of the area or the shape of the area based on any traffic density studies?

A. Admiral, I can't honestly answer that directly. I can give you my best guess because I have tried to answer

those questions myself in my investigation, but I ran out of time.

I can tell you that, in general, major shipping lanes are all North of the Northern-most portion of this boundary so that there are no major shipping lanes that would come through this boundary. There are shipping that come through this boundary, not just the EHIME MARU, but others on a routine basis, because of inter-island traffic.

But, the vast percentage of merchant shipping would be on a track north of the line on the marking here [pointing laser at exhibit]. For example, from here to about this direction [pointing laser at exhibit] would be Panama Canal and then up through Alaska down here and then over to Japan here.

So you have a general semi-circle of the shipping that's going to stay North of this line I'm horizontally drawing here. I asked this question of the Coast Guard indirectly through CAPT Kyle's offices. And their response was as I just described, that the major shipping lanes are generally all North of the line I'm drawing here above the northern most portion of this boundary.

So to some degree the Navy did assign this water to the GREENEVILLE knowing that it was doing so conservatively with regard to merchant shipping.

Q. In SUBPAC's operational hat, they assign this area to the submarine, is that correct?

A. Yes, sir.

Q. Do you know if SUBPAC has ever done a review in the last 5 years, 10 years, any review of the traffic density? Have they asked for any studies? Are they aware of any studies?

A. Admiral, I'm not aware--I can't answer the question one way or the other. And I think that's probably grounds for good further testimony.

Questions by a court member (RADM Sullivan):

Q. Admiral, in your investigation, was there any indication that the USS GREENEVILLE operated outside of her assigned area on the 9th of February?

A. Admiral, I determined she never operated outside of her assigned area. She always stayed within her assigned area including the buffers for position and uncertainty with your means of fixing the ship's position. So the answer is she stayed well within the confines of her area throughout the time she was submerged.

Q. Is there a--for defense mapping you can see when they go about making up the chart. Do they have an area here that is based on an input from the submarine community in our Navy on where to put the sub operating boxes and if so is that currently accurate on the charts that are promulgated today by Defense Mapping Agency?

A. To the extent that I could determine, the entire area surrounding the Hawaiian Island have grids and the submarine force uses all those grids intermittently as the needs of the force to transit and to operate come up.

The issue of the transit lanes is one that I'm not particularly aware of the answer. It may be or it may not be that the assignments of submerged areas are done to exclusively avoid those transit areas. And I think that is something that further investigation is probably warranted.

Q. Additionally, was the driving factor on why GREENEVILLE was operating up in this part of their operating box driven by the time-line for the distinguished visitor embark--is that in fact what you are opening to that location?

A. Yes, sir. I would say time and distance. They wanted to make sure that they didn't go farther than they needed to go to get the mission accomplished because it would just add time. And, I might add, I asked the Coast Guard not only for merchant shipping, but also for fishing activity and pleasure craft activity and their answer is that if you--you probably can't see it on this chart, but approximately where I am circling it with my laser [pointing laser at exhibit] there are fishing buoys, FAD, various nomenclature buoys, they are called FAD and then additional numbers or letter around the island. And the small pleasure craft occasionally do go

out and fish in the vicinity of those buoys because they tend to attract fish.

There was such a fishing buoy about where I am putting my laser pointer now down in the lower portions of -- I should say in the more northern section of the area assigned to the GREENEVILLE and I pursued with the National Transportation Safety Board Investigation whether or not the Master had any intention of honoring this buoy in his transit and it turns out he did not. This was not a part of his plan.

His course of one-six-six on the EHIME MARU had nothing to do with these buoys, but rather was aimed at coming well South in order to clear the land mass by several hundred miles to do international fishing. But finally I just want to add that the Coast Guard did not feel there was a reliable way to determine where pleasure craft would be to avoid them, that they are very unpredictable so he may be just as well to be here as here to avoid them in the opinion of the Coast Guard.

Q. Admiral, I would like to follow-up on the question on the "Papa Hotel" time relative to where the GREENEVILLE operated. It is my understanding that this area that the GREENEVILLE was assigned was for the entire day. Is that correct?

A. Yes, sir.

Q. So the Hotel--"Papa Hotel" time which was the time to be near the entrance to the channel to return to Pearl Harbor at 1400, that's more of an administrative time, that if the ship is late it is not a significant event. It is a matter of just getting back into the queue for reentering port. That they could have stayed out as long as they wanted and not have been outside their assigned operating areas.

A. I think that's a fair statement, that they had the ability to change that time and make it later with very little cost. That is very little cost with regard to the port facilities where you have to arrange a change in the support arrangements.

On the other hand, I'm sure on the Captain's mind was the desire not to overly inconvenience the guests who probably had plans based on the promulgated schedule for the rest of their time that day on the island. So that

would be the other side of the equation he would be considering. But there's no question that the CO had the ability to prolong the period of time at sea before they came to buoy "Papa Hotel" if he chose to make that change.

Q. Admiral, in your opinion is the current box that defines the OPAREA, is it in the right spot? Is that OPAREA in the right position for submarine operations and if so, why?

A. If I were assigning the GREENEVILLE areas to operate in today to conduct this type of mission, this would be a very logical assigned area. Now there is land obviously protruding into this assigned area. There's also shoal water--relatively shoal water in this region up in here, which the ship would not want to operate deep submerged in.

But in general, it is good water, clear shipping lanes, and although you don't want to hit these few buoys that are in there, otherwise, unencumbered by obstructions and reasonable to allow them to operate in and not too far from homeport.

Q. Admiral, you know that the CINC has tasked the court to answer the question, "Is the OPAREA in the appropriate spot?" In your opinion, it is in the appropriate spot?

A. In my opinion, that did not play a role or a factor here. I think it was an appropriate operating area assigned to the GREENEVILLE.

Questions by a court member (RADM Sullivan):

Q. One more follow-up. For local operating areas for submarines, does a submarine Commanding Officer have a chance to have an input where the area is? If there is a chance he can move the area, will the submarine operating authority move that area?

A. Yes, sir. The submarine operating area will listen to inputs from the ship. And if he can accommodate the ship and the ship has a logical reason for a request he'll try to accommodate him. There will be occasions when he will accommodate him and occasions when he won't based on other constraints. But the bottom line answer is they do have an input.

Counsel for the Court: Thank you.

MBR (RADM STONE): I would like to see Exhibit 17 closer. If you could have that brought over.

[LCDR Harrison did as directed.]

Questions by a court member (RADM Stone):

Q. There's a box on there that addresses the submarine test area. And I'd like RADM Griffiths--if he could address that box that is within the operating area that is the assigned GREENEVILLE area. You'll see it's on the chart. If you could read what that box says.

A. Submarine test and trial area.

Q. What does that--its purpose on the chart? What's that meant to tell mariners?

A. I believe that's an anachronism. I believe that has served its purpose and we just have not got around to removing that from the chart. I think that in general mariners pay no attention to that indication and that it has no true role in the way we operate our submarines today or assign them operating areas. I think it was a-- as I understand it, it was assigned back in the 1950's when it was a practice to conduct certain types of trials there as a matter of routine for our diesel submarines that did not have long legs and there was a reason to keep them restricted to their homeport area.

And I say they don't have long legs, they didn't have a lot of endurance on the battery. Before they had to recharge their batteries with diesel engines, so unlike diesel sub--unlike nuclear submarines today, there was an important reason to give them a very restricted area to operate in. And it may have also served, in those days, as a warning to merchant vessels because these diesel submarines would have to routinely raise their snorkel above the surface of the water and recharge their batteries while running diesel engines and they were burdened but they were also very cumbersome and unmaneuverable in that condition. And so there would have been more of a reason to have that area in the diesel boat era and less so today.

CC: Admiral, I have no further questions.

WIT: Okay.

Questions by the President:

Q. Admiral, I would like to go into a couple of areas that kind of go to the collision, but I'm going to take you back--I want to go back and look at the mission for the boat again--for GREENEVILLE. I would like to look at some of the impact that the DV embark could have had, whether it was a watchstander issue or the escort issues.

I would like to go back and talk specifically about the senior rider onboard. I believe that was the capacity he was onboard, as the Chief of Staff. Specifically, in compliance with his own memo in terms of when he rode a particular boat what he expected in terms of reports.

And I'd like to spend a little bit of time on the training value of this particular underway for the GREENEVILLE. There was a lot of discussion yesterday. I heard--we did the emergency deep for training. We did emergency blow for training and I want to come back and ask a couple of questions about that.

What did you think the vision was for GREENEVILLE on the 9th of February?

A. I think their primary mission was to demonstrate the prowess of this warship to the visitors.

Q. So the primary mission--not to put words in your mouth was a DV embarkation?

A. Yes, sir.

Q. And that was the only mission that she had that day other than the subset of the fact that you get training value when you get underway?

A. That would be the only mission other than you'll always have that subset present and your gaining value from it--the training.

Q. To your knowledge are there any rules or regulations or guidance for DV embarkations when that is the only mission for a naval unit, whether it be an aircraft or ship?

A. I know that, in general, the practice is discouraged of getting underway only for that mission. Higher authority has promulgated that in general these underways should be concurrent with other operational requirements

where the ship would need to be underway anyway. So this is an exception to the rule that is provided by higher authority.

Q. Maybe you can take me through -- at one time the ship had been scheduled I believe to be underway through this particular period for operations. You had mentioned that she had been in a maintenance availability over the past several months--last couple of months and that she had a scheduled underway time that had changed and then this DV embark had been added on the 9th of February, is that accurate?

A. I think that's almost accurate. The only change I would make is that I think that the DV embark had been on for awhile as well, but coincident with another underway up until the other underway went away.

Q. So the DV embark had been scheduled but as part of an ending of an already scheduled underway period?

A. Yes, sir.

Q. And then that underway period went away, but the DV embark remained?

A. Yes, sir.

Q. Do you know why the DV embark remained? Was it an oversight?

A. I believe it was a conscious decision to not derail the significant efforts by these civilians from all over the country to come to the ship and ride, and at considerable cost and effort.

Q. To your knowledge is there any guidance given to submarine Captains about their DV embark? In other words, this is what you're expected to demonstrate. If it's got such high value, and we believe it has high value, are the CO's given some sort of guidance or template for demonstrations that would increase the value of that embarkation or is that dependent upon the CO, and the time that he is given, to provide the best type of professional demonstration to the distinguished visitors?

A. There is generally no specific guidance to the CO that directs the type of evolutions or suggests the type of evolutions that he should conduct. This is left to his discretion. And it of course, is tailored to the amount of time that is available, and to some degree to the audience.

For example, if you were going to take a specific audience that had a warfare background, a joint group of General's for example who had broad work experience across the military service's then the captain may decide to try to demonstrate a warfare scenario as the focus and thread throughout the underway, the different types of literal contingency capabilities of the ship in warfare.

If there were civilians that didn't have that warfare background he may want to just more closely show the general dynamics of the ship and its crew as in the case this time with the GREENEVILLE.

But I think it's fair to say that we give broad latitude to our Commanding Officers to choose these evolutions because they have the requisite experience and judgment to be able to do that well.

Q. Yes, but the DV embark is a specific type of embark. It's different than embarking war fighters, it's different in inviting certain military visitors, it's different than a family day or tiger cruise. There are several types of embarks that are out there. So go back specifically, was there any guidance or formulation or suggestions from the squadron or the Type Commander to submarine CO's about how they should tailor DV embarks?

A. I think the answer to your question I can most truthfully give is they reserve the right--they, the senior flag officers reserve the right to provide that guidance on the occasion that the specific make up of the ship becomes particularly DV. And if it's for example, delegates from Congress, primary members of the Senate or of the House, or senior DOD representatives from the OSD and so forth, then generally flag officers would get involved and give specific guidance. That's the way I run Bangor, Washington, for example. But absent that type of unique guidance, just talking very well intended citizens, educators and the like, we would leave that to the discretion of the CO's is the impression that I get here at Pearl Harbor.

Q. Do you know if any of the crew, specifically the tour guides, were there any specific briefs given to the crew about what their DV embark would be like, what their duties were as an escort, what type of--what were they expected to show the DVs? Particularly if they saw--the crew saw a potential impact in terms of their duties on watch. Were there any specifics mentioned to the crew in terms of a brief at--you know, just prior to or during the embarkation to remind the crew of their responsibilities with the DVs onboard?

A. I cannot answer that question. I did not have time to develop that information and that's a good question and I just don't know the answer. However, I would like to say in my interviews I was able to determine the ship felt comfortable in this type of evolution because they had done it before and they considered it the same as they had done before and that they knew what to expect. To some degree, experience had brought them to a level where they were comfortable doing what they were doing. But I can't answer the question with regard to the types of specific training they gave the crew before the evolution.

Q. Again, let's go back to the 2 months or so of a maintenance availability. When was the last time GREENEVILLE executed a DV embarkation?

A. I don't know the answer to that.

Q. Okay. Did you feel the CO was--since there was no set agenda for demonstrations, was the CO--did he feel free to modify? In other words, in the sense, this is what I want to do? This is what we published so that's the plan. Did the CO feel free then that he could modify his plan? Did he show evidence of any modifications to that plan or did he pretty much stick with the plan for demonstration--for the embark on the 9th of February?

A. I'm not able to answer that question, except that on one occasion, through interviews, I was able to determine that he considered deleting the emergency blow and then decided not to. So that would be an indication that he did feel that he had the latitude to make a change to the plan. And furthermore my opinion is that this CO would make any changes he felt appropriate. He wasn't shy and timid about being in charge and making changes to operate the ship as he saw fit.

Q. Okay. I'll go back specifically to the lunch. The lunch was scheduled from 11 to 12. We talked about the messing issue particularly in the wardroom. One of the values of having a DV embark is that often the DVs eat with the crew because there is great value in sitting with the crew members and seeing what their lives--I know that you mentioned that the Mess in terms of how the food is prepared to share. But there's a separate Wardroom for the officers and there is an enlisted mess for the crew in terms of how they did it. Now did the crew--what drove them in terms of their decision? So, I see that decision to extend the lunch time as a modification of the Embark Plan that they had published because I recall the lunch was between 11 and noon.

A. Yes, sir. I would disagree with you. I feel that the ship--the CO intended all along to have two settings in the Wardroom and that his guests--all will eat in the Wardroom. And that the 11 to 12 time was really for the crew. And I think that the ship felt that it had that latitude to make that change within the white lines.

I think that the CO felt he would be distracted in running the ship for a large part of the day and that that lunch was the one time he knew he could count on to really sit down and talk to these guests on an individual basis and personally. So I really think that although eating in the Crew's Mess is certainly appropriate--and we do it a lot on submarines, particularly for dependent's cruises--when you have a relatively small group of visitors that were distinguished like this that, that you would target them to eat in the Wardroom, although that's arbitrary and the ships.

Q. Okay, but my understanding is that this was an unusually large number of DVs that were embarked, 16. Can you give me a sense of what's an average out there typically in the SUBPAC boats would typically embark?

A. Sixteen is about the average, 15 or so is the average as I understand it. That is what I was able to determine for this class of submarine, in contrast to Trident submarines where I bring aboard 60 at a shot. But, it's a much, much bigger ship.

Questions by a court member (RADM Sullivan):

Q. Admiral, as a follow-up to the President's question. This was a unique underway just for a DV embark. During your investigation, did you see signs for the normal requirements for a submarine to be underway, such as a Sonar Search Plan, a Navigation Plan, all those requisite plans that are normally approved by the CO prior to going to sea to operate so that the submarine is basically not operating in an ad hoc fashion? Did you see any evidence of this sort of pre-planning?

A. Admiral, I did not see them, but I also did not have time to see them. I think that might be an area for the court to examine further.

Q. During your interviews with the individuals, was there any interpretation by you--by yourself--that they had any qualms about having someone move or get out of the way if they are interfering in the watchstations? Did the crew understand that?

A. Well, because I am so perplexed that that did not happen with the FT of the Watch, I can only ponder that question because it's a very disturbing thing that that did not happen in that one case which could have made such a difference. However, to be honest I just don't know how I could assess answering that question. Through my interview process I was not able to determine that this crew is anymore reticent, or any more capable of interjecting their opinions when needed, than any another group. I just found some subtle indicators that the way this ship ran was very much a ship that was run under the direct control of the Captain. And the impact of that may have been that he would get less advice than on a ship where the Captain was--delegated more of the operational decisions to subordinates.

Q. One other question. I was struck by the number of crew that was left behind for the day. It seemed to me more than I was used to seeing, 51 enlisted sailors and 6 officers. And looking at the Sailing List it looked to me like there were seven Sonarmen, including the Chief left behind as well as the senior FT of the Watch or FT--the Chief. Did that seem excessive to you in your review of some of the Embark Programs?

A. Admiral, I have a sense that there may have been some missing ingredients in the sheer numbers that they took to sea. If they had a highly qualified crew and those

are the ones they took to sea then the numbers they took would have been enough. But if the piece parts were lacking as you examine who those individuals were and that left them with a shortage of some of their key watchstations, like in Sonar, then that would be a problem. I did not have the opportunity to fully ring out those questions. There may be some meat there.

Q. Admiral, a follow-up on the DV participation. You've already testified about the three that were actually manning the controls and the fact that you felt they did not impact on what actually happened in terms of control of the ship. Now, did you see any other events or instances where you felt--and maybe the reports from the Fire Technician might be one of them, I'm only suggesting that. Did you see other instances where DV participation may have impacted the way the ship was maneuvered or controlled or the way reports were made to the chain of command, particularly the Control Room?

A. That was the central question I tried to evaluate in my brief investigation. And I'm not sure how much I was able to uncover to truly answer it. I only had indicators.

For example, in several of my interviews I had people who were in Control make statements that they weren't able to see this indication or they weren't able to see that indication because of the people that were there. And so that lead me to a sense that the ability--the sheer ability to backup your fellow watchstanders, by helping them look at their indications, providing them recommendations would be impeded in a passive sort of way by having more people in Control than normal.

I think that the other part of the question, "Well, what was the decorum of the guests?" My own experience, which is pretty extensive, in seeing guests underway on ships, and the interviews that I conducted from the GREENEVILLE issue would indicate that these were very typical guests. They were polite. They had very quiet demeanor. They knew not to disrupt these busy watchstanders in this nerve center of the ship, the Control Room. They tended to be still and observe and not be disruptive in their mannerisms.

So if they intruded--if they impeded it would be merely from their presence and the fact that they took up some of the visual and standing space in the Control Room and not anything beyond that. And so to the degree that they disrupted the crew, it would only be in a very passive sort of way where they were causing more people to be in Control than normal. And hence, less ability for the normal watchstanders to operate and back each other up in what they could see and say to others.

Q. Well, you made a very important point. You said that 16 was a fairly average number--15, 16 was a fairly average number of DV embarks in terms of individuals. And yet you just said that the Control Room was too crowded, that there were too many DVs in there. Does that seem--that seems like a disconnect to me. Why do you say there was too many in Control when the average number of visitors was about right?

A. I don't remember saying too many. I'll grant you I may have lead you to that conclusion by what I was saying. I think that the number of people in the GREENEVILLE's Control Room was actually a little less than she would purposely put in there in certain evolutions like battle stations.

Now I will grant you that the people in the Control Room for battle stations are all crew members who have assigned duties and fully understand their role and their decorum and how it applies to the mission, but nevertheless, it's even more people than the ship had on this occasion by a hand full. So we should recognize the ship can function and function safely with this number of people in the Control Room, although it's more difficult. It requires more effort.

So generically, I'm not sure it was too many to briefly demonstrate what the ship was doing. In hindsight perhaps it was too many, but I think the routine submarine out there today, or prior to today, conducting these types of evolutions, would probably tend to bring most of their guests into Control as well.

PRES: Put the exhibit up that shows the Control Room please.

[LCDR Harrison did as directed.]

PRES: Let me ask a couple of follow-up questions there RADM Griffiths.

Questions by the President:

Q. Yesterday there was a comment made--I believe you made the comment about the Fire Technician of the Watch--Fire Control Technician of the Watch felt like there was a barrier between his station and his ability to make his report--I think rightfully so to the Officer of the Deck on what he had--what his displays were showing. And you described, your earlier--the--as I recall that the DVs were positioned from here into this "L" [pointing laser at exhibit]. When you said physical barrier were you talking about specifically distinguished visitors standing in the way, was that the barrier?

A. Yes, sir. I was just using the barrier, perhaps in the sense that there were people there that wouldn't normally be there for routine operations that would impede his sight line to the Conn and vice versa. And would be people--he would have to stand-up and perhaps move beyond in order to have a face to face conversation, or he would have to project his voice over their presence to be heard by the Officer of the Deck.

Q. Did that impression come from your interview with the Fire Control Technician?

A. Yes, sir.

Q. That he felt that the DV was a barrier that he couldn't speak around?

A. Yes, sir. Not only a verbal impediment--I'm not saying it could not have been overcome, but it was an impediment, but also his access to this watchstation chart which is called the Contact Evaluation Plot--was also impeded by a number of people that were standing between him seated here [referring to Exhibit 6] and this location several steps away.

Q. Does it make sense to say the person standing here -- I can see how it interferes visually with the sight line, but how does that interfere when we are talking basically 10 feet or so, I assume, between the Officer of the Deck and the Fire Control Technician of the Watch? How is that a verbal barrier for the watchstander?

A. To you and I, I don't think it is. It was in his mind and he stated so.

Q. Let's go back to the sonar watch then, again. Do you see with the same placement of the DVs did they become barriers then for the sonar's watch performance of his duties, in terms of either passing reports or allowing the Commanding Officer or the Officer of the Deck or the Executive Officer or whoever is participating in the control of that boat from getting into the Sonar Room?

A. No, sir. I don't believe it acted as a barrier in the case of the effective operation of sonar. For one thing you are talking the CO and the XO and their mobility in and out of Sonar. They don't let the mere presence of strangers get in their way. Their presence is enough that they go and do what they have to do even if it means asking people to step aside. There is also a forward door into Sonar that may have been used on some occasions particular by the CO or XO who were mobile and not constrained to Control. And then, finally, there are routine communication circuits that don't require a physical presence for the people in sonar and the people in Control to talk effectively to each other.

Q. I would like to move on to some questions about training. The ship got underway to support a distinguished visitor embarkation and to support training. I find it odd that the ship left a number of her crew -- I'm not sure what their status of qualifications were, but did the ship demonstrate any ability to conduct training, i.e., when they -- besides normal evolutions of getting under way, angles and dangles, emergency deep, or emergency surface, were there any indications of watchstander sign off by the crew as a result of this embarkation? In other words, was there any qualitative way and quantitative way of measuring the training that the ship conducted?

A. Admiral, there probably is. I have no idea what the answer to that is. I can only conjecture. I didn't have time to pursue that.

Q. I understand that, but if a ship is going to get underway for training after a significant amount of time--I'll say those are my words--in a maintenance availability, why would she choose to leave so many of her crew at home when it was a training opportunity?

A. I think, like, in all decisions it was a trade off. And I'm only conjecturing. The ship said, "Hey, we're only going to be underway 6 to 8 hours and we've had certain number of people who have been busting their butt in maintenance and other ways helping the ship and we want to give them the opportunity to

have a 1 day break--who we like to grant to people who are working very hard and so with the people that--and the evolutions that we are going to be conducting at sea will be relatively limited."

For example, only some of the sonar systems were used this day because it was a local operation. They didn't stream and use the towed arrays so that reduced tactical value for sonar example. So I think the ship balanced what she could gain at sea for those people she left in with what she was trying to do for them and their day ashore on liberty. And take care of the families and so forth and try to make a balance. Now that is my conjecture.

Q. How would you describe the training value of angles or dangles for the crew? Specifically we have the maneuvering watch and the Chief of the Boat--Chief of the Watch of rather that section. Is there great training value for the crew? I think you commented that the Chief of Staff in your interviews--that everyone was impressed with the ability to conduct those operations?

A. I think there is significant training value. I think it is a very positive event and routinely conducting it has a lot of--makes a lot of sense to me. Particularly if you are rotating additional people through the Ship Control Party who experience it, either as a under instruction watch or a primary watchstander because the main training value in addition to the whole ship having that renewed confidence that it can operate at large angles and right speeds without problem, I think that the main value is in the Control Party right here who continue to get that proficiency. That's the only way you can get it, so I think it has significant proficiency inherent.

Q. Would you describe any other evolutions or areas of the ship that benefited from the training value of this underway like you did for the Control section?

A. Well, first of all, if I were able to evaluate who were under instruction throughout the entire ship those people were obviously accrue significant value. Because there are so many practical factors you cannot achieve unless you're underway and that's fore and aft.

Secondly, the demonstration of these events for those who hadn't done them very often even though they were qualified gives them the proficiency of having conducted them with both proficiency and confidence. So, I think you can make a statement that there's general value

throughout the ship in conducting these type of training events at sea.

Q. Let's talk about a specific evolution in terms of its training value. I think you used the words yesterday "emergency blow for training" and specifically, my understanding is that emergency blow is basically a maintenance requirement to validate the systems of the ship to support an emergency blow, ballast tank, valves, alignment, etcetera. That requirement is as I recall a for 1 year--every year the ship has to demonstrate that for preventive maintenance purposes, MRC, maintenance required----

A. Yes, sir. I believe there are more frequent requirement within a year that are static in nature and not dynamic where you don't let the actual air flow, but check some of the actuators. But the actual complete emergency blow process is an annual. And in addition, it's required after certain maintenance periods such as she had recently conducted the end of calendar year 2000. And the ship had conducted the emergency blow in conjunction with completing that maintenance period prior to this underway. So, this was in addition to maintenance.

Q. So, what would be the value of that event in terms of training, the emergency blow?

A. Well, from a maintenance check of the operability of equipment, it was not needed. The only value would be in the demonstration to the crew and the visitors that the system is very effective.

Q. But the crew had just done it recently?

A. Yes, Sir.

Q. Any follow-up questions?

MBR (RADM STONE): Yes, sir.

Question by a court member (RADM Stone):

Q. Admiral, with regard to the FTOW station you commented yesterday how reading two or three contacts is really not too much for the management team to handle. If indeed you end up in a situation with multiple contacts, say 15, 20 contacts, does there become a threshold where you increase the watch there at the FTOW station? In other words, what's the norm in terms of activity that would drive you to increasing that watch from one person to say two people manning up the multiple consoles that you have there?

A. There is no definitive threshold in writing where our ship would add watchstanders. That's the judgement of the Officer of the Deck and the Commanding Officer that comes into play there. But when their internal thresholds are exceeded, then they direct further watchstanders to be stationed when they're not comfortable that they are adequately assessing the contact picture. And so to some degree that depends on the recent history of the ship--are they half way through the deployment where they've been doing this a lot? Is this the first underway in awhile? How comfortable are they? Which is a judgment that they have to make on that particular occasion.

Q. Did you get the impression that with a third of the crew ashore that there weren't available people to augment that station if it was thought that because of the number of DV's in the space and the situation that the FTOW was encountering, that there weren't people onboard the boat to go augment that watchstation as a result of so many folks being left ashore?

A. I'd be surprised if that was the case. I can't answer the question directly. They would have to have shown some flexibility to move people around to augment the watch. My guess is they had the people onboard and could have done that had they chosen to. It may have meant re-assigning a few people who were off watch from tour duties or other duties to assume that watch. My guess is they had those assets aboard.

Q. With regard to the DV amount of time underway for that evolution, you provided us some data in your investigation that talked about the roughly 6 hours that GREENEVILLE had assigned, but you also had gave us a sample of another submarine that did an emergency surface and their time underway was about 8 hours and 15 minutes. And when we look at the time required to do an emergency blow where you want to take ample time to do it properly your target motion analysis, and your time, and your periscopes sweeps, that 8 hours and 15 minutes seems much more realistic as I looked through that subs itinerary. Was 6 hours enough time in order to safely execute--for any sub--the itinerary that was listed for GREENEVILLE?

A. I believe 6 hours is an adequate amount of time. I think that in looking back over this particular underway the periods--where they could have used more time in certain evolutions, we're not talking a large amount of times, we're talking maybe 5 more minutes to do this evolution, 3 more minutes to do that evolution. A total of a relatively short aggregate additional amount of time. Time that was there within the way they executed their schedule and the lunch period, and so forth, or that would have required a only a short extension of the underway. So, I think a nominal 6 hours was enough time to execute the schedule that they had set up for themselves.

Q. I note there's no 5050 Notice. A notice in which it outlines onboard our ship when we do have significant events, number of issues relating to the escorts are, what the itinerary is, what safety precautions are to be in effect. The POD--is that the only source document that you were able to uncover on how the DV embark would be conducted?

A. Yes, sir, that was the only document I was able to uncover. However, there maybe other documents that exist and that I just was not able to able to uncover yet. That was the only one I was able to read.

MBR (RADM STONE): Thank you.

PRES: This court will be in recess for 15 minutes.

The court recessed at 1432 hours, 6 March 2001.

The court opened at 1451 hours, 6 March 2001.

CC: Sir, let the record reflect that all parties, Counsel for the Parties, members of the court and the court reporter are again present.

PRES: Let's call RADM Griffiths back to the stand, please.

CC: RADM Griffiths, would you please take a seat in the witness box. I would remind you, sir, that you are still under oath.

[The witness resumed seat in the witness box.]

CC: Admiral.

MBR (RADM SULLIVAN): Admiral, I've got a couple follow-up questions on our recent discussion on the DV embark and administration of their crews.

Questions by a court member (RADM Sullivan):

Q. Did you see any indications that the guest themselves were indoctrinated into any submarine safety or their roles in the protocol of being around watchstanders, staying out of their way, and so forth? Being quiet in Control.

A. I didn't have any specific evidence that I could review one way or another to determine that. It is my assumption that that occurred at least orally prior to the ship getting underway by their monitors on the ship--members of the crew. However, I don't know.

Q. So your experience is that it's normally or typically done for one of these embarks?

A. Yes, sir. They are orally briefed in the process of getting on the ship by their assigned tour guides. That's how I do it in Bangor. I actually complete that brief before they even get onboard the ship. I don't know how GREENEVILLE did it in this case.

Q. I understand. The next question I had was--we were talking about the number of individuals--people that were in the Control Room that's shown here on Exhibit 6. You eluded to or discussed that during the ship's--when they were at battle stations approximately the same number of people would be in the Control Room. Could you describe for the court the distribution differences, if there are any differences, between what you would see--what you assumed during a battle stations scenario versus a scenario that was conducted during this emergency service?

A. There would be some slight differences. In particular the areas that I'm circling on the after part of Control here [pointing laser at exhibit] would be filled in by crew members in addition to the other areas that we've already talked about. Additionally, there would be someone seated at each of these locations--a watchstander at in each of these five seats in a row here [pointing laser at exhibit]. There would certainly be more than four seats filled in here in Sonar, plus--in other words there'd be up to seven or more operators in Sonar. Over here [pointing laser at exhibit] in addition to navigation you would also be conducting tactical plotting on one of the two tables here [pointing laser at exhibit]. This installation here in the corner [pointing laser at exhibit] would be very tactically significant. So you would see basically all the white space filled in with watchstanders in a battle station scenario. And I think, actually, it would be up to five people more than were present during the collision.

Q. So, in your opinion the Approach Officer or the Officer of the Deck would have the same challenges to see the fire control solutions--screens in a battle station scenario.

A. It would actually be almost a bigger challenge because there would be a few more people, and all of these displays throughout the entire Control Room, wherever they would be, would be coming into play and have tactical significance in a battle station scenario. There would be an effort needed to be able to get to see all of them. Whereas only some of them were in use in a daily operation such as they were on the 9th of February.

MBR (RADM STONE): Thank you.

Questions by Counsel for the Court:

Q. Admiral, but would those additional watchstanders at battle stations be standing as you described the DVs were standing in this area on the--I guess that's the port---
A. Starboard.

Q. Excuse me. Starboard--starboard side?

A. Yes, you would see that all the seats would be taken in these spaces, and in addition, there would be people standing wherever you could stand at battle stations. It's a very densely packed time for the ship and essentially all the room is taken up.

Q. So, distribution of people would be about the same as you saw the DV distribution that day?

A. Approximately, but that--in the after port corner there may be a few less people in battle stations. And there may be a few less people in the very central forward part of Control here [pointing laser at exhibit] and--I'm conjecturing.

Questions by the President:

Q. RADM Griffiths, you've been drawing a parallel between the density in the Control Room at battle stations, with the number of DV's. But isn't one of the big differences--if your at battle stations those additional watchstanders are put there specifically to make direct reports on a specific display, or responsibility appropriate to their watchstation? And they would make those reports at a battle station very clearly and directly to the Officer of the Deck or the control point at which they were assigned to support the Officer of the Deck the Executive Officer or the Commanding Officer in their duties.

A. Yes, sir. You're exactly right. They would have additional circuits they would be speaking into and then it would all funnel eventually to the Captain. So you would have much more circuit discipline. You would have much more definition of duties in each locale and watchstation. And I'm not trying to draw an exact parallel. The only parallel I'm drawing is the number of people and they're not quite the same.

Q. The parallel I would draw is that we talked specifically about the Fire Control Technician of the Watch who felt he had a barrier at battle stations. I don't think you could say he felt he had a barrier.

A. I agree with you that he would not claim a barrier in battle stations.

Questions by a court member (RADM Sullivan):

Q. Another area, just to shift gears on you, we talked about the watchbill and your inability to find a promulgated or approved watchbill. Could you comment on the other log keeping and documents that you used or received from the ship to conduct your investigation, as far as completeness, thoroughness, and accuracy?

A. Yes, sir. In general I'd say this was a weakness I uncovered when I conducted my investigation. However, I want to emphasize, I don't think it directly lead to the collision. I think that it was a weakness in helping me to reconstruct the events that lead to the collision, in contrast to how they operated the ship.

And I'll give a few examples. The actual entries on the Contact Evaluation Plot were very sparse and there were essentially no contact entries for the hour leading into the collision. There may have been a few, but it was not continuously being maintained. And this is a plot that a ship would normally continuously maintain. And if they ran out the opportunity for the Fire Control Technician of the Watch to make that plot--maintain that plot to the right standards then the ship would augment with an additional person to keep the quality of the plot up. And they did not have useful data in that hour before the collision on this plot.

A second example would be, in Sonar they did not have a work tape--an acoustic work tape of what they were listening to on their passive sonar for the period leading up to the collision. The guidelines for operating this system require that that tape be normally operating. And what this tape does is just recording noise that the ship's sensors are hearing so that they can play it back later for further analysis. The reason for this tape is not in case an accident happens. In other words, in contrast to the black boxes, if you will, on an aircraft that may be helpful for accident investigators if the plane crashes. That's not the

purpose of this tape. Rather its focus is mission oriented where you may inadvertently have an opportunity to collect acoustic data on targets of interests and then want to analyze it later and bring it back for further analysis ashore. But, in this case, it was an example of a procedure you would expect a submarine to be following and they weren't following that in Sonar.

A third example would be in the plotting of the ship's position on the geographic plot. They were using a mylar overlay to the paper nautical chart. And it turns out that the period where the ship had operated for that hour up to the collision that recording on the navigation mylar was erased. And my assumption, based on my investigation, is that it was inadvertently erased, not purposely erased, to eliminate data because navigation really wasn't an issue here after all. When they steered back over their courses, and it would make the recordings on the mylar confused, they would periodically erase it to give a clean picture to the Officer of the Deck where they were. Those mylar recordings were not retained for that period leading up to the collision.

Those are some the examples of the difficulties that we had in gathering the data after the fact.

PRES: Any more questions on the DV side?

[Negative response by all.]

Let's shift the subject. I'd like to talk about the role of the Chief of Staff of Submarine Force Pacific Fleet.

Questions by the President:

Q. He was embarked on the 9th of February on USS GREENEVILLE?

A. Yes, Sir.

Q. What was his role or capacity on GREENEVILLE?

A. His major capacity was to represent the Force Commander for these distinguished visitors and to interface with them during the visit and to help make their visit more meaningful and enrich their experience. But he had several other reasons for riding.

A second reason for riding is he wanted to evaluate the ship's performance. This is a routine practice by senior staff to ride the ships and witness how they perform, for a number of reasons. One which is to help and determine better ways to do things. Because each ship may have techniques and performances that are unique to them that they've developed that would be worth exporting to the other ships. So you can learn if there are better ways to run the railroad.

Additionally, you're always trying to make your own judgements of how the senior players on the ship are performing. Because sometimes the senior staff get involved trying to mix and match those senior players when they move on to their next career move. And learning their attributes and their strengths gives the senior staff a way to help to interact in a meaningful way with the detailers for their next assignment and so forth. So there was that secondary mission which is routine whenever a senior officer would ride a ship.

A third reason was that CAPT Brandhuber's son-in-law was the Engineer Officer and was about to transfer from the submarine upon the completion of his engineer tour. And CAPT Brandhuber had not had a chance prior to this to go see his son-in-law and share in that experience and to witness firsthand the impact he'd been able to have on the ship, particularly on the Engineering Department. And this is something that he desired to do. And I can understand that.

And finally, he wanted to develop some more hours underway, which he's required to do on a monthly basis in order to qualify for operational submarine pay. He's always searching for ride time hours or else he loses that financial benefit.

PRES: Well a couple of questions and follow-up questions.

Q. Did the Chief of Staff display any notes on the performance of the USS GREENEVILLE and any of its evolutions?

A. I interviewed him twice. He only provided me oral renditions of his observations and I don't know the question--and I don't know the answer to whether or not he developed written notes.

Q. Was he asked by the CO to observe any evolution in particular to potentially improve the performance of the ship, or is it going to be kind of what ever he stumbled along in his escort duties for the DV's?

A. Sir, I don't know the answer to that question.

MBR (RADM STONE): I've got a couple of questions also pertaining to the Chief of Staff and also the overall reason why. As we look through the moments prior to the collision, and some of the issues in our discussion yesterday about target motion analysis and how much time would be the submarine standard for doing that properly, and how much time it would take to properly do a periscope search. Time becomes a very big factor here, and so I'm wondering what role the Chief of Staff played in this issue of "we need to be back to port at a certain time."

Questions by a court member (RADM STONE):

Q. Were you able in your investigation to find out whether or not there was any pressure from the Chief of Staff for that submarine to meet a specific time line?

A. Yes, sir, I pursued that in my interview--two interviews with CAPT Brandhuber and my determination is that, in CAPT Brandhuber's mind he did not add any pressure to the ship. He certainly did not have any conversations that would have implied pressure. And he does not feel his presence should have created any undue pressure on the Captain to make sure he was back on time. Now, whether that's the case or not, is something that both CAPT Brandhuber and the Captain--CDR Waddle, perhaps could testify further on. But to the best I could determine, he made no overt attempt to influence the Captain in that regard.

Q. I note that the SUBPAC Chief of Staff has a policy memorandum that was provided to us dated 6 September 00. It's his standing orders and policy while embarked. In the first sentence he states that, "responsibilities set forth in reference (a) require that I be provided certain information when I am embarked." And reference (a) is U.S. Navy Regulations. When you review U.S. Navy Regulations it talks about a number of roles for senior people at sea. One is the Senior Officer Present Afloat. Another category is Senior Officer Present and then there's another Senior Visitor Embarked. Were you able to determine through your investigation what role the Chief of Staff was serving in accordance with reference (a)? Which one of those three--what category he fit under?

A. I believe in his mind he felt he was fulfilling all three roles.

Q. Because there are obvious duties and responsibilities associated with each one of those, we will be probing that very deeply to ascertain what role he was in. Also, in his memorandum, he says that as soon as practical, after he embarks he'd like a briefing on the operations and the schedule for the ship's evolution. In your investigation, did you find out if he ever received such a briefing?

A. I did not find out one way or the other whether he received such a briefing. However, if I could comment at this point, Admiral, the reference you're citing is a standing generic document that he creates for every underway. In other words, he does not change it and tailor it to each underway, but that's the standard off-the-shelf document that he provides when he arrives. It's generally based on his senior's--RADM Konetzni's--similar guidance to the ship. And of course you would expect naval regulations in the role of the flag officer embarked to be different than a captain or below.

My guess is that this guidance was more rigorous than CAPT Brandhuber expected to be executed in this particular short underway. Although he didn't modify it, it was generic set of guidance and he and the Captain probably took it with a grain of salt this short underway.

Questions by the President:

Q. Well, there are some specific--so the question is do you think--here it is, it's COMSUBPAC Chief of Staff Policy Memorandum 00-1, 6 September 00. Was this in effect when he rode the GREENEVILLE?

A. My guess is that--I don't know. The answer is that I don't know. My guess though is that it was in effect and the ship considered it in effect until released from some of the obligations by CAPT Brandhuber if he did.

Q. Well, I think we are going to work and ask some questions here while we have the opportunity and I know the scope of your investigation--you didn't have the opportunity because of your time to go into all this stuff. I appreciate your very straightforward answers on this RADM Griffiths, but as an example, there's a very specific request in here that says, "Reports: I expect reports on significant changes to the ships status relating to ships control, navigational readiness of the ship to perform planned drills or operational commitments." Now in your testimony yesterday, there was a great deal of discussion of the importance of the AVSDU, the Analog-Video Signal Display Unit I think is the way to describe it correctly. That this had a significant importance to the Officer of the Deck and the Commanding Officer in terms of the ship control. To your knowledge, was that information ever passed to the Chief of Staff and did he ever asked for it?

A. He was informed of this status early in the underway and he noted it with--he noted it because of its significance and his rendition of the--in my interviews with him he recalled this event as being a significant material issue.

Q. Did he use those words, "significant?"

A. I don't recall if he used the word "significant", but I got the impression that he thought it was significant in my interviews with him.

Q. I asked that question because the next question is did he ask the CO what modifications he would put in place in terms of a Temporary Standing Order to compensate for the loss of this display?

A. Admiral, I don't know.

Questions by a court member (RADM Stone):

Q. Based on his experience as the Chief of Staff, his operational experience--his seniority, would you view him as being the most likely person to have detected an unsafe situation developing during the emergency surface evolution on the 9th of February? This is the Chief of Staff I'm referring to.

A. I understand the question, Admiral. I think the answer needs to be qualified. He certainly is the most qualified onboard by experience. Therefore, he should have the judgement to be able to do that as well.

But the reason I want to qualify it is a short analysis of what we expect from this kind of rider when he's on a ship. This is--now you're getting into Griffith's opinion based on my experience in the execution of my commands. When I ride a ship in my current state, I don't expect to override the Captain on a routine basis. In fact, I would set the threshold at a very, very high level whenever I would directly override the Captain when he's in command of his ship. Because by Naval Regulations that just isn't done. There are ways to provide suggestions to the Captain in a way that does not impede his command authority.

In fact, you need to be a Flag Officer embarked on a ship to be able to direct the Commanding Officer and a Captain, such as CAPT Brandhuber, by Navy Regulations would not have that authority. So he would be in a position to suggest changes to the operations to the Captain if he felt that some threshold was being exceeded where he felt the Captain was doing something unsafe. Necessarily he would draw that at a very high level. In other words, he would not make that decision that the Captain was being unsafe lightly, but he would only do it under very significant circumstances that were beyond a shadow of a doubt to him.

Now when this type of officer is riding a ship--when I ride a ship, I don't routinely watch every evolution with a go, no-go type of decision outlook on whether it's safe or not. I generally take that into general account. And there may be certain evolutions that I target to go watch because I think they are particularly significant, particularly fraught with risk or so forth. And I might suggest that, in CAPT Brandhuber's mind, the evolution

that he targeted was the ship control evolutions associated with the angles and the high-speed turns because that is a perilous evolution if not done well. And he put himself in a position to help observe that.

He did observe that. He saw that GREENEVILLE performed in an exemplary fashion. That was a benchmark for him--and this is based on my interviews with him. And to that degree he then--not backed off, if you will, from observing, but, went back to his main focus, which was interfacing with the guests. So when he went through the evolution of the periscope depth preparations--periscope depth and emergency blow--he was back here [pointing laser at exhibit] in a position where he was hampered in his ability to directly observe the type of evolutions that we've been talking about for the last 2 days.

So, in summary, what I'm trying to say is that, the senior rider would walk the whole ship. He would pick the evolutions that he would be very specifically watching and then he would otherwise be generally in the background. Always ready to step in and advise the Skipper if he thought that appropriate, but requiring a very high threshold to be exceeded before he would want to do that. Now that's the way I would explain how I ride as a ship--ride a ship as a senior commander.

Question by the President:

Q. But as a submarine qualified officer would your expectations be that the Chief of Staff, in his position in the port aft side of Control, would have been able to detect poor reporting to the Commanding Officer and the Officer of the Deck in terms of support from the watchstanders? Would he--wouldn't he understand the climate of the Control Room? And wouldn't he have high expectations in terms of the quality of the reports and the timeliness of the reports? Would he have to be physically engaged in the control of the ship not to be able to sense whether or not those reports were of a quality enough to support the Officer of the Deck and the Commanding Officer?

A. I think in general, the answer to your question is, he should be able to get a good sense of that from wherever he was standing in the Control Room. And that obviously there are places in Control where he could get an even better sense. But there's nowhere in Control

where he would not pay attention to that and be able to make an assessment of that.

Questions by a court member (RADM Stone):

Q. Along the same lines, the issue of time. With the Chief of Staff's experience, would he be able to be in the Control Room during this time frame that we're talking about here, and know that the transition of the submarine to go through the various target motion analysis legs; to go through the proper periscopes procedures that everyone's been trained to and that we saw today in the simulator that there's a certain element of time for the ship to be able to safely conduct those events. And therefore, based on his operational experience, he knows the minimum time requirement basically to do that safely. And therefore his position as the Chief of Staff at SUBPAC, he would know that something was amiss. Do you have an opinion as to whether, based on the timeline for these events, that the Chief of Staff was in a position to know that you can't do those events in that reduced timeline properly?

A: I've thought a lot about that question. And I honestly think that he probably should have had some signals going off in his mind that things were being hurried. And I think that--I know that he's in hindsight going over this and over this in his own mind because he brooded about this in my interviews with him. So, I guess my answer is, I think he should have had a sense that corners were being cut. And from wherever he was in Control and I think you should pursue this in his testimony.

MBR (RADM STONE): Mr. President I have some questions about the XO and OOD's role, but I'll defer those until the appropriate moment.

PRES: Okay. Let's go ahead then and proceed into some collision questions. Specific questions as it applies to the collision.

MBR (RADM STONE): Admiral, I'd like to try to get to the heart of the matter as I see it now and that's the excursion to periscope depth which really set the stage for what followed.

As you testified to yesterday, proceeding to periscope depth is a very basic procedure. However, even though we do it on a routine basis, it is done very formally, and done with great care, because of the jeopardy the submarine is put in as it moves from a deep depth where it can't be struck by a surface ship to a depth where it could be struck. When I worked on these questions, I also worked with RADM Ozawa who is another submariner. And we independently, probably not surprisingly, came up with almost the same types of questions to ask, because proceeding to periscope depth on any submarine is done around the world basically in the same fashion, with the same formality and the same seriousness.

Questions by a court member (RADM Stone):

Q. With that said, will you review for the court, once again, what you would consider the submarine forces standard proceeding to periscope depth after you have slowed after a high-speed transit or in the case of the GREENEVILLE, where you were conducting evolutions that your sonar systems basically were not that--all that functional to be able to tell you what the surface picture is. And with that, I'd like to go into what the GREENEVILLE actually did again.

MBR (RADM STONE): And to help, could you please put up the displays on the depth profile and the one sonar contact Sierra 13, it's-- it's the time/bearing plot. That looks fine. And, then also the one that has depth profile. You might have to turn the lights in order to use the chart.

[LCDR Harrison did as directed.]

WIT: Yes, Sir. Again, the basic approach in preparing to go to periscope depth would be to be at 150 feet, and at 10 knots or less--approximately 10 knots--and conduct a 3 to 5 minute leg on a given course, searching the unbaffled areas to annotate which contacts were there and what their bearing rate direction was for that period of time. Then to deliberately choose a new course that's designed both to uncover your previously baffled area and develop further target information on the targets that you already hold. And compromise if you can't do both, to at least uncover your previously baffled area. Which means a turn of at least 120 degrees either left or

right. And then hold that new leg for 3 to 5 minutes of data on the contacts held on that leg, which may be the first leg for the contacts in the previously baffled area, or may be a second leg or more on contacts that you had previously held. And then make a decision on subsequent maneuvers as necessary. That would be the bare minimum. So you're talking 6 to 10 minutes on two legs total, plus the maneuvering time in between.

An assessment of the contacts in the aggregate that you've held from that and whether or not you have reasonable fire control solutions on them that show their not close in range. And then once that evolution is completed--and again I'm speaking generically now--you would adjust the controls of the various sensors for an ascent to periscope depth. The Captain would grant permission of the Officer of the Deck to make the ascent to periscope depth.

Q. Can I ask you, is there typically a briefing of the watchstanders prior to going to periscope depth?

A. Yes, Sir. The Officer of the Deck would alert the Sensor Operators in Sonar, Fire Control, ESM, that he was preparing to come to periscope depth. First, he would tell them he was preparing, and that would be their opportunity to focus their watchstation to be ready to do that. And then, once the maneuvers and the assessment of the contact picture was complete, he would say he's proceeding to periscope depth. That would place everybody in that be quiet in a bi-stable mode unless you think you are about to have a collision, in which case you speak up. And you know, so that's a very important command. And then you would make the proceeding to periscope depth evolution happen.

Q. Before we proceed, you discussed that the Officer of the Deck makes his report to the Commanding Officer. What does that report consist of? What's the detail level of that report?

A. The details of that report are, "Here is how I've done what you tell me to routinely do to make sure that I'm not going to hit anybody going up by conducting target motion analysis to assess the contact picture." And then, here are the results of that assessment how many contacts I have, where they are, what my estimate is of their range, and why I'm choosing this particular course to go up on.

Q. Is that report typically done in person or could it be done on a phone? Or how would it be done say if the Commanding Officer was standing on the Conn with the Officer of the Deck?

A. The normal method that would happen would be for the Officer of the Deck to make a face-to-face report such as that to the Commanding Officer while both of them stand on the Conn. If the Commanding Officer was not present in Control, he would find him through the circuits on the ship and then relay that same information over that circuit--communication circuit.

Q. So, in your experience, what does it typically take to get with--with the number of contacts in this case--maybe three to four contacts--what is the typical time frame from start of the evolution until you are at periscope depth? How long does it take?

A. Until at periscope depth? 10 to 15 minutes. That's a--that's an average.

Q. Okay.

A. And it depends on the--the contact situation. Because there--for example, if you find a new contact when you uncover your baffles on that turn, well you kind of have to start the problem over with that guy and so that lengthens the time. If there's nobody in that previously blind area, well then, you can cut out some of that time and just develop the picture on the guys you already have, and so forth.

Q. Do you have to have a solution on each of the contacts say to the quality that you might shoot a--launch a torpedo or just have a relatively good sense of value of where the contact is?

A. Admiral, you need to know only that they're not going to be close. I mean, you would like to have a 100 percent perfect solution on everybody, but you don't need to achieve those standards to safely go to periscope depth. You just need to know that they are not going to be so close that in the time it takes you to get to periscope depth and in the first few minutes up there, you're not going to be run over. Now, if you have a very high-speed contact, that would be an example where you might treat him a little differently, because they can cover a lot of water in a short amount of time. And that may require a new assessment by the Captain and the OOD.

But for normal contacts, you just want to know that they're--say outside of 5,000 yards.

Q. So once you are at periscope depth and you commence your search as you described yesterday, how long does it typically take before an Officer of the Deck or a Commanding Officer would feel comfortable that he has established a visual--a parameter, if you will, of 5,000 yards that there were no contacts within that that were immediate an collision risks? On daytime--typically of the day we had on the 9th of February?

A. Normally that would take at least 10 minutes of target motion analysis at various courses at 150 feet.

Q. But I'm talking about once you're at periscope depth, searching with periscope.

A. I see. How long to determine visually that you're verifying there is nobody close? I would guess that it would take about 3 minutes, and that's--that's a rough order of magnitude because that's kind of interpolating between the tactical guidance given ships and the real visual execution of that when the safety of your ship is your sole purpose. I would still think 3 minutes would be required to do a high-power search of the full horizon.

Questions by the President:

Q. RADM Griffiths, yesterday you mentioned that there often wasn't an analysis in terms of the sea conditions in terms of your periscope height or depth of the keel because you are often--under tactical situations you would train to observe those conditions then you'd change the height of the--the water on the keel would change the height of the periscope. So when you say 3 minutes, do you--is that 3 minutes after you've achieved the right periscope height?

A. I'm really being asked to give too precise an answer. That, about 3 minutes would include all of the variations on the theme, to go in shallower, trying to pick out which sectors perhaps have poor visibility and giving them more attention, correlating the sonar contact bearings exactly, and the like. So, the 3 minutes is a very rough--because it's so dependent on the situation. But if it was all done in less than 3 minutes, I would wonder.

Q. Okay, but by 3 minutes, it would include the fact that the Officer of the Deck or the Commanding Officer, whoever is controlling the time, would--would make the appropriate changes in periscope height. So when you say 3 minutes, you include that calculation?

A. Yes, sir. Now if the Diving Officer is having a particularly hard time controlling depth and the scope is frequently under half that time.

Q. Okay.

A. But absent that kind problem, 3 minutes should probably be able to get it all done. At least 3 minutes. I'm setting that as a floor.

Questions by a court member (RADM Sullivan):

Q. A baffle clear is typically done anytime the ship goes to periscope depth, is that correct?

A. It's also done when you are not going to periscope depth periodically, but yes, as a minimum, you must do that before going to periscope depth or else you risk somebody behind you and running over you.

Q. But there are a few exceptions, one of which is to conduct an emergency blow. Another one is during approach and attack. Are there any additional precautions that the submarine fleet takes to ensure that the visual pictures as well are understood before departing periscope depth to return without a baffle cleared?

A. Before going deep from periscope depth?

Q. Yes, while you are at periscope depth.

A. Would you repeat the question again, Admiral?

Q. If you decided that you were going to come back up without conducting a baffle clear, for instance, during approach and attack, or in the case of the GREENEVILLE, for the conduct of an emergency blow where you are going to actually come through the--up to the surface without another baffle clear. Are there any additional items that a submarine typically will do to ensure the safety of any close contacts?

A. Well, there is a--well first of all, the most important thing you can do is to do it quickly. Get down and get up quickly so that the picture doesn't degrade from what you visually confirm to be a clear area. But

if you wanted to, you could also operate radar. Now, this is a significant investment in time to prepare the radar mast for raising, raise the radar mast, get the radar mast rotating and radiating, tune it in so that you start to have a good picture, and then assess that picture, and then add that to the other sources of data you have, secure it, lower it, and then go deep into the blow. So, that would be another variation on the theme. That would be a sizeable investment in time. But as long as you secured it right before you went deep it doesn't eat into that time that the contact picture could degrade before you come back up again. So that would be another potential thing that they could do.

You could also turn as you're going deep before executing the blow, which would uncover your previously sonar baffled area. And in the actual occasion here, that's what GREENEVILLE did is it turned as it went deep. Although its purpose was to head in the direction to be able to go home after surfacing, it had the effect of clearing its previously baffled area.

Q. What about coming shallower to get greater height of eye for the periscope?

A. Yes, sir. I now understand the direction of your question. The high look is perhaps fundamental to really ensuring that your time at periscope depth is optimized to visually detect targets. And the easiest way to do that is to just order the ship broached. Submarines do do that when detection is not an issue. And in this case it wouldn't have been. So the ship had an option of ordering the submarine broached. Which would, as a minimum, put the top of the sail to the surface and cause an additional 8 feet or so of periscope height of eye above the surface and greatly extend the range by 2 or 3 miles to the horizon. And that would have been a very conservative move. In this case that would have added greatly to the ability to see a more distant contact or the same small contact more reliably.

Q. Because in reality, if you are looking to do this event, and you plan on coming back up within 5 to 6 minutes--say 6 minutes--and you have all of the speed of your own ship in the line of sight of another contact--even a high-speed contact, maybe at 20 knots, and give yourself--maybe you're going 10 knots, that's, that's 30 knots in the line of site, that in 3 minutes, that's what 6,000 yards. So you need 3 to 4 miles assurance that's clear, is that a correct analysis?

A. Yes, sir.

Q. Okay, could I have you return to the events of the 9th, and describe how GREENEVILLE executed the same event that we just discussed over the last half hour?

A. In the case of the GREENEVILLE's conduct of the evolution, she commenced going to periscope--correction, going to 150 feet and slowing and preparing to do the baffle clear at time 1331, and was on a leg of three-four-zero or so, heading towards that direction, and was on that leg for a brief period of time, I would say approximately 3 minutes or less.

Q. Was she at depth, at 150 feet during that time?

A. For the latter part of that. She was in the transition from 400 feet at the start of that, so at time 1331, she is slowing. She is changing depth to go more shallow, and she is turning to this new course. So there's a dynamic start of that few minutes. Then she steadies up and an assessment is made of the DIMUS display of sonar--the sonar display of contacts versus bearing that are out there.

Again, I want to remind everybody it was--it was right on the heels of a very disruptive period where the sonar displays were not very useful because of the high-speed turns. And so we're just coming out of that period, and here [pointing laser at exhibit] I'm trying to show, are the bearings that they started to receive on Sierra 13. Not their only contact but one of the contacts being displayed then. And she chose to make a turn to three-four-zero which was a good leg to further--further understand Sierra 13. Now there was a northwest contact then, that that would have put that contact into the baffles, so I was not able to ascertain whether that was a good course for that additional contact at four--roughly three-four-zero at that time. But it was a good course for Sierra 13, and it's a little more to the

north. And she proceeded on that course for approximately 3 minutes, which was borderline of good length, because she was getting good sonar data at that time on Sierra 13, and had determined that there was no new target in the baffled area, and that was important. And I guess you can make the determination that--that was in my opinion the first good leg for target motion analysis. But that was a leg that was judged sufficient for the Skipper, and at that point he directed the Officer of the Deck to go to periscope depth.

Questions by the President:

Q. RADM Griffiths, yesterday I think you described--you used the word standards a couple of times and I think that's where RADM Sullivan was going. But I want to make sure I understand that there are submarine force standards at 150 feet. You described of a course going to the north when she was transitioning from 400 feet to 150 feet. She was transitioning from speed of approximately 20 knots to 10 knots or so, at 150 feet. And that leg was 3 minutes--that transition period. So there's some transition period and some--some time at 150 feet, and then she turned to the west/southwest, and her first, as you described then according to a standard, I assume, her first good leg was on that course of about 3 minutes?

A. Yes, this leg on three-four-zero was I think about 2 minutes long.

Q. Okay.

A. And then, the leg on three--on one-two-zero that she turned to was about 3 minutes long. And then she went to periscope depth.

Q. Okay. But, that doesn't fit the standard that you expressed yesterday for a submarine----

A. No, sir.

Q. At 150 feet. Okay. I understand.

A. It was an abbreviated target motion analysis process.

PRES: Okay.

Questions by a court member (RADM Sullivan):

Q. You commented yesterday that I believe it was 80 seconds of periscope depth?

A. Approximately.

Q. In your opinion--it's short? What about the--the maximum height that the periscope came out of the water. Would you consider that a--as you say, a high look?

A. I would consider it higher than the ships norm, but not a high look in the intent of the procedure to truly verify the area clear. The Skipper had 8 more feet to use and he didn't use it. It was available for free.

Q. Could you explain to the court where the requirements that we were just discussing, where they come from? Where the Type Commander promulgates how to come to periscope depth?

A. The Standing Orders that the Type Commander promulgates discuss how to proceed the periscope depth. The Captain of the ship, CDR Waddle, has Standing Orders that also address it--that elaborate on the Type Commander's Standing Orders and additionally there are tactical memorandums in the submarine force that discuss how to proceed to periscope depth.

Q. In the case of the GREENEVILLE would you discuss, as you did in your report, the material condition of her sensor suite to be able for her to execute safely the maneuver?

PRES: Can I interrupt, Paul?

MBR (RADM SULLIVAN): Sure.

PRES: Before we go there, I want to ask RADM Sullivan to restate that question, but I want to go back to the standards issue again, so I can understand this.

Questions by the President:

Q. So, you've given in your testimony, Admiral that you've mentioned that you saw 3 minutes was the--what you felt was an appropriate amount of time to make the right adjustments either for height of the eye to do, what I think all submariners do, a rough mental calculation of here's the distance to a visual horizon based on the height of the eye and the observed sea conditions that when I get there under those type of conditions and the proper search where there is high-power low-power, high-look, level-look. I don't want to get into all those technical sizes, but what I understand is a description now is you've all described a standard of about 3 minutes for that type that you felt would be reasonably sufficient to establish the right visual search and to be satisfied that that visual search had been correlated to other sensor data that had been arrived at at the 150 foot level, is that correct?

A. Yes, sir. I want to, if I can say that we are trained to use the periscope in a much more rapid fashion than that tactically. Because it's a visual cue to the enemy. And so there's a departure from that line of thinking here when safety of ship is the issue time is a valuable investment to lengthen the amount of time you're at periscope depth. So, I would say that 3 minutes is a floor on being able to get that done thoroughly.

Q. Well that goes to the 80 second comment under that standard 80 seconds did not measure up to the standard of amount of time to spend at periscope depth?

A. Yes, sir, it does not.

Questions by a court member (RADM Sullivan):

Q. Looking at the trace of the bearing versus time and the fact that they had no visual contact when GREENEVILLE went to periscope depth--in your investigation, did you see any effort on part of any of the crew members to resolve that discontinuity of a contact with a fairly healthy or significant bearing rate and not be able to see it when you expected to see it?

A. I have no indication that anyone on the ship recognized that healthy bearing rate right in there [pointing laser at exhibit], which was while the ship was still proceeding on course three-four-zero and I don't think anybody noticed it. And I think the reason they

didn't--and I'm conjecturing that it was just on the heels of all this dynamic display data from the high-speed period and they didn't recognize it. Because it would clearly be a bell ringer to the Sonar Operator, to the Fire Control Technician, to the Officer of the Deck, and to the Captain, had they recognized it.

Question by the President:

Q. Maybe you just answered my question. So, in an order of a sense of that high drift rate, which is kind of like an antennae I assume, it's got to make everyone's antennae go up, if they had recognized that type drift rate. This is based on the demonstrations we saw today. So it would have been an order probably the Sonar Operator would have been the first--in parallel the Fire Control Technician of the Watch should have also sensed that same piece. The problem then is, you have the visual line of sight issues that maybe the Officer of the Deck and the Commanding Officer had. But it goes back to them to those two operators primarily recognizing that drift rate and making a report based on that drift rate.

A. In recognizing it was different from the dynamics that they'd just experienced for several minutes and as the data settled down, is the signal now reliable? Are we getting a reliable bearing rate as compared to when the ship was at high-speed and that making that transition and recognizing we're now stable and it counts. So, there's some--there's going to be some period of time as the human eye recognizes that and the human mind recognizes we're now in a different mode of viewing this data. And to give the ship credit that takes a finite amount of time and they were on this leg very briefly.

Obviously, in hindsight it wasn't enough time for them to recognize that bearing rate because they would've all queued to that. That's something they're trained to do. And also I want to just remind you, sir, the Officer of the Deck and the Captain have the handicap of not having that AVSDU display on the Conn working.

CC: Excuse me just for a minute. Admiral, if I could ask you to slow down in your answers with the translation.

PRES: I think we're all contributing to that problem right here as we get into some fairly intense questioning. So, we'll try to be more deliberate in our questions and not interrupt each other. I apologize. Go ahead, RADM Sullivan.

Questions by a court member (RADM Sullivan):

Q. Admiral, I'd like to just look at this material condition of this sonar suite. We talked quite a bit yesterday about the lack of the AVSDU, used generically as the Conn's remote sonar display, that's on the Conn. And with that out of commission--which occasionally occurs on the submarine--what types of things would you have expected the ship to do to compensate for the loss of that vital piece of display equipment? Or, in your opinion, what types of things did you see them do to compensate for the lack of having that sensor presentation?

A. To answer that question in the reverse order that you asked it, Admiral. What I did see the ship do through my interview process is that both the Captain and the Executive Officer spent more time in Sonar than you would normally expect them to, personally looking at the displays that were in Sonar and no longer available to them on the Conn. The senior leadership was trying to compensate by their personal observation.

I think after the Captain had done that type of checking he then asked the Executive Officer to fulfill that role. So there was a sharing of that sense of needing to see the sonar data by the two senior officers.

Now, to answer the first part of the question, what would I have expected to have seen. My experience as a Captain of a submarine similar to this one a decade ago or more, was when that device broke on a deployment, I required a Temporary Standing Order to be followed by the ship which required additional care in assessing sonar contacts before tactical decisions on that assessment were allowed to be made.

Q. So, you'd actually--this evolution--the standard you described would actually be--you'd expect it to be slower versus faster?

A. Exactly. I think the most important parameter that would change would be you would invest more time in your

deliberations on the tactical picture before making decisions to change the ships status.

Q. Would you expect the fire control displays to become more important--more monitored by the Office of the Deck and other people in Control that were overseeing the contacts situation?

A. Yes, Sir. I would expect them to get even more scrutiny, because you have fewer things to use to provide that tactical assurance now in Control with the AVSDU out of commission. And the fire control system is that main set of sensors--that main set of analysis equipment that can't provide you equivalent data to what the sonar display would have otherwise have shown.

Q. In other words, in my mind, the FTOW--Fire Control Technician of the Watch would probably have more oversight in a situation that the GREENEVILLE found themselves in.

A. Yes, sir. You can really pile on with all kinds of good ideas in hindsight here on how they should have compensated. I think the fairest way to say it is that investing more time and deliberateness in their tactical decisions in some manner that they would need to figure out how to execute, would have been warranted.

Q. This piece of equipment--to clear up my mind, was out of commission prior to underway or after the ship was underway? Do you recall?

A. I can't tell you exactly when it was noted to be failed. It was either just prior to or just after underway when they were conducting either pre-underway checks or when they were trying to use it upon the early part of the underway. There's some ambiguity in my mind on when was failed, but it was noted to be failed. But it was essentially at the start of the underway.

Q. Were there any efforts that you saw to attempt to trouble shoot or repair this important piece of equipment?

A. The assessment, as I understand it are from interviews--the assessment by Sonar to the chain of command was, in order to effect repairs it would have been very disruptive on the Conn where you're controlling the ship. And that awkwardness would not have worked with going out and submerging and conducting the

evolutions. So they would--they needed to find some other way then just fixing it to compensate.

Q. You don't feel the large number of Sonarmen off the ship contributed to inability to do technical repairs?

A. I don't know the answer to that question, Admiral. I didn't pursue that.

Questions by the President:

Q. Admiral, let me ask you a question about compensation. You mentioned that with this display not being available, and my understanding was, that it apparently failed as it got underway. I think you are very accurate in your description of the fact that it was going to be difficult to repair and do what they had to do in terms of controlling the ship and actually work on that piece of gear. But the Commanding Officer--you mentioned that you--one of your procedural changes would be a temporary change to your Standing Orders. Was there any temporary change to the Captain's Standing Orders that you could detect or any written--any guidance--verbal guidance to the watchstanders as a result of this?

A. No, sir. With the exception that there may have been some direction to the Executive Officer from the Commanding Officer to assist in providing monitoring of the sonar display in Sonar. Testimony may help reveal further on that. Otherwise, I don't believe that there were any additional Standing Orders created or---

Q. But that's a form of compensation. Your taking your number two, your Executive Officer, and your putting him in critical Control space. That looks like compensation to me. What were the expectations of the Commanding Officer when he put the Executive Officer in that space? When did he do it and how long was he there? I would be interested to know that. And what do you think the Commanding Officer's expectations were when he specifically put his number two into that space?

A. I want to be careful here because I'm hazy on my recollection of the interview data that pertains. All I can recall is that the XO was asked when the ship was getting ready to go to periscope depth--about in that time frame--to position himself in the forward into Control to see into Sonar and provide assistance. I believe it was in that period of time that he did that.

Q. This was after the 150 foot search--sonar search?

A. I'm not sure. It might have been during.

Q. Well, can you answer what the CO's expectations were when you put your Executive Officer in that space?

A. I would be conjecturing.

Q. Okay. Would it be that you expect a very high level of oversight into that space because you put your number two guy there specifically?

A. Yes, Sir. It would be. And I now do have a recollection because I remember a statement the XO made in an interview that the displays looked like a lot of disruption. Again, as I told the court, I think this was the period where the displays were too dynamic to be useful and I think the XO assessed that. So this would clearly be in the period preparing to go to periscope depth. So, that place is in time. Yes, I would expect the XO's scrutiny to be very diligent, professional, and helpful.

Q. Was there any change that the quality of reports that came out of Sonar? Was there any noticeable change as a result of the Executive Officer? That could be for a couple of reasons. Maybe there was nothing significant to report. But could you detect in any of your statements that you took that there was a change in the quality of the way those reports were made to Control?

A. No, sir, I can't make a statement one way or the other on that. I don't know.

Q. Was there change to the improvement or was there an improved quality of situational awareness on GREENEVILLE as a result of putting XO in Sonar.

A. I don't know. I can't honestly answer that question. I don't have enough data. I did not get a chance to pursue that in interviews.

Questions by a court member (RADM Stone):

Q. Admiral, on that. I was reading through the Preliminary Inquiry last night. Enclosure (5), a statement by LT Sloan the NAV, dated February 11th. Page 2 in the summary of his testimony--his interview says the AVSDU OOC reported by NAV 0715 to 0730 told Sonar Supe who came out to look at it, Petty Officer Holmes or Reyes, also informed CO prior to underway. That's LT Sloan's statement. If in fact that is true would the report to the Commanding Officer of that system being OOC prior to underway, would that viewed as go, no-go criteria? In other words, since we're still pier side let's go ahead and fix that prior to getting underway?

A. No, sir. I believe that a ship should be able to get underway and operate safely and come back at the end of that day without this piece of equipment operating. However, compensation would be appropriate when it was out of commission because of its importance to the Officer of the Deck understanding the ship's contact picture. But certainly it's not a fail to sail item. The ship can operate without that piece of gear. Submarines, in general, have a lot of gear that you can compensate for and continue to operate safely without. And I would put this in that category.

PRES: Thank you.

Questions by a court member (RADM Sullivan):

Q. Admiral, back to the material condition of the sensor suite. I read then in your investigation here--your report. Were there any other pieces of equipment that affected the operation of the GREENEVILLE that day to directly throw her out of commission?

A. I would say, no. I could give you some equipment that would be important on a mission to be out of commission, but for the operations they were going to conduct that day, the answer is basically, no.

Q. Okay. Let's shift gears here a little bit, but staying on the same theme of the ship's operations of approaching near periscope depth. I was struck by reading your report of some of the lack of formality. For instance, the FTOW of the afternoon watch didn't know the AVSDU was out of commission until half way through his watch. The fact that a number of the key members of the Control Party thought they had different types and different numbers of contacts as they're getting ready for periscope depth. Could you comment on your assessment of the formality of the way GREENEVILLE was operated on the 9th of February in the watchstations?

A. Yes, sir, I will, with the caveat that I have an incomplete picture because I had to rely on second hand reports from interviews. And so I don't feel real confident that I have a complete picture of whether that was formal or not. But I have varying pictures. I think there were some reports that were made in a formal manner and the processes were conducted formally and then I have evidence that there were some others that were not conducted formally. It would not surprise me to have an after the fact interview of the key watchstanders a day later and to have some disparities in the recollection of the contact numbers and the bearings an hour before a collision. I think that to some degree that disparity in recollecting Sierra numbers and the bearings of those contacts and how many there were in that hour before the collision is a natural phenomena of decay over time of recollection. But then there was other indicators such as no information displayed effectively for an hour before the collision on the Contact Evaluation Plot that can have no other explanation than a low standard was applied to maintaining that plot.

Q. Well back to the formality of going to periscope depth. As I read your report, it was not clear to me that the scenario you described as where the Officer of the Deck makes his formal reports to the Commanding Officer, who gives permission to proceed, didn't necessarily occur on this day. That the Officer of the Deck was really in a minor role and not where he should be in the middle of trying to sort out the contact picture to present that to the Commanding Officer. Rather the Commanding Officer was, in all intensive purposes, acting as the Conning Officer or the Officer of the Deck, am I wrong in that assessment?

A. Admiral, I think you're partially wrong. I pressed on this issue because it's a central issue to the backup the CO was getting in the operation of the ship from this key watchstander. I think to some degree the Officer of the Deck, who was relatively junior and relatively inexperienced, was merely a respondent to the CO's direction. To some degree the Captain was directly involved in a lot of these evolutions, perhaps more so than he would normally be or than a typical CO normally would be. And therefore the Captain was presupposing the answers to the normal reports he would get and cutting them off to save time. And so that is what partly what was operating here. I think that this is an issue that needs to be pursued further through testimony, because I was not able to talk to some of the players and pursue this personally in interviews.

Q. Could you comment on the relationship that you were able to derive, if any, between the Commanding Officer and the Executive Officer? How they work together as a team? What there type of communications were in this scenario?

A. Yes, sir, I can. I wanted to pursue this area through interviews and was not able to. I think that's an area of some frustration to me, because I was not able to interview the parties. The issue of the forceful backup to the CO, both from the Officer of the Deck and the Executive Officer, are still areas that require further examination. And I'm frustrated that I was not able to very much in that area in my investigation. I have indirect interview reports from other people that would lend some credence to the theory that the CO was over-directive, particularly of this Officer of the Deck. And that, therefore, the Officer of the Deck may not have had as substantial a role in being the forceful backup to

the Commanding Officer for the safety of the ship as the Naval Regulations and Force Commander would like. I was not able to get good evidence one way or the other on that presumption.

I was also not able to get very far in determining whether or not the XO and the CO had a working relationship that was one where the CO's counsel was frequently sought and ineffective or not. I think that's something for the court to pursue. I'm only under the assumption that the XO did frequently provide the CO forceful backup because that's the standard in the fleet. There were extenuating circumstances in this occasion where that may have been made even more challenging for the Exec to accomplish because of the distinguished visitors, the compressed time frame. The CO was obviously in charge of the evolutions and personally directing most of the actions. So there were even more of a heightened challenge than normal for an XO to stand up and interject. I was not able to pull the string on that very well, and I think that's work undone.

Questions by the President:

Q. Admiral, given that for this analysis so far, some sense that the ship didn't meet standards in terms of it went 150 feet, or meet standards at periscope depth and so there's a deterioration of the ability to use sensors whether it's periscope, the non use of radar, ESM, Sonar, that would build situational awareness and alert different members of the--there's a team there in Control, right, that are responsible for the safe navigation, conduct of maneuvers of that ship. It starts with a CO and goes right down to through Officer of the Deck and goes through the different watch teams that are there. Was there anyone that you sensed--and I'll go through some individuals here, that you felt had a sense of good situational awareness in terms of S-13--Sierra 13. Do you feel the Commanding Officer had a good sense of situational awareness on Sierra 13?

A. I think at the time he thought he did. I'm certainly sure he did at the time.

Q. Based on fact though--based on what we know. That red line that you showed us yesterday?

A. Well, in fact, I'm sure he didn't correctly understand the parameters of Sierra 13 at the time,

although he thought he did. I'm sure he wouldn't have gone to periscope depth otherwise.

Q. How about the Officer of the Deck?

A. I think the Officer of the Deck had an even a lesser understanding of Sierra 13 because he was not able to frequently go into Sonar.

Q. How about the Executive Officer?

A. I think the Executive Officer was in a position to certainly have as much concern as the CO, based on his location in Control, and his proximity to the displays. I think the XO had concern about the time frame things were being executed in, independent of the data being displayed. That's the most conviction I have is that the XO was concerned about time frame.

Q. I think we've been able to determine--to correct something--that the XO got into the Sonar about the time the ship was approaching 150 feet for the first time. I think we have been able to establish that.

A. Yes sir, I think he was in there during the period they were preparing to go to periscope depth at 150 feet.

Q. How about the Sonar Supe?

A. I think the Sonar Supe was making frequent communications with the Commanding Officer on announcing circuits. Interviews would support that they had a dialog, they were discussing the contact picture. So I think the Sonar Supe was involved. He had a very dynamic display and short legs. And I might also add, the Sonar Supe is providing raw data and it's difficult for him to make reverse engineering criticisms of the Officer of the Deck about the way the ship is being driven. The Sonar Supervisor and Sonarmen generally have to accept the way the ship is driven from Control. They just have to live with whatever legs they get. So, my assessment----

Q. But did he give--okay--let's make sure I understand this. He may not have had good situational awareness of Sierra 13, but he was aware that he didn't have very good data? I realize he's not reverse engineering. He can't say--you suggest, but did he make sure that the team--the Officer of the Deck and the Commanding Officer knew that his data wasn't sufficient--didn't develop into any type of situational awareness?

A. Yes, sir, he should've been--he should've had a sense that he had not had a chance to provide enough good TMA on the legs that they had driven.

Q. How about the Fire Control Technician of the Watch?

A. A lot of the responsibility for assessing the adequate amount of knowledge on contacts rests on his shoulder by the nature of his watch and his duties. He clearly was in a position--and as you can see from that range-versus-time was in a direct position to influence the Captain and the Officer of the Deck's decisions.

Q. Based on specifically this data here--this stream of data--this stream of data here [pointing laser at exhibit], that he should have had, in your judgment, a fairly high sense of the situational awareness that he had a contact that was fairly close?

A. Yes, sir.

Q. How about the Chief of Staff who was back in the aft part Control. Would he have a sense from any of the reports being made--would his antenna be alerted to Sierra 13 or a surface contact of concern?

A. I don't think he was in a position to know much about particular contacts. He was in a position, if nothing else though, to judge that the time lines were too abbreviated for the tactical processes that were going on.

Q. Is there anyone else in the Control, in terms of a watchstation duty, that you felt had some situational awareness--or should have some situational awareness on potentially Sierra 13?

A. No. I think I've run the gamut of who would be directly involved in that.

Questions by a court member (RADM Sullivan):

Q. Could I ask the same question a little different, Admiral, in that, during your investigations, did you get the sense that anyone mentioned by VADM Nathman were concerned, not necessarily with a given contact, but the way the ship executed procedures that they routinely did--have executed in the past, in the rapid fashion that they did or the manner in which they did. For instance, to go from slowing to periscope depth and back and do an emergency blow in 12 minutes. Did that strike anybody as a bit abnorm--unusual?

A. Yes, sir. An interview the Executive Officer conducted with Commodore Byus before my involvement with the investigation, revealed that the XO felt that the amount of TMA prior to proceeding to periscope depth was abbreviated, and that the--if nothing else, the ship's depth that was ordered for the high look in the time at periscope depth was not shallow enough. He was thinking these things to himself mentally, but not articulating them to the Commanding Officer or the Officer of the Deck.

Q. Any explanation for not expressing his views--isn't that his duty?

A. I believe it is his duty to bring up concerns he has with the way the ship's operating to the Captain and the OOD. I would be conjecturing on why he didn't bring them up on this occasion.

Q. He was the lone person that had concerns.

A. I also got a sense from CAPT Brandhuber that he felt things were going quick. The implication was too quick for the complexity of the evolutions and their importance. But much less a direct sense of that, in his thought process, than what the XO was thinking.

Q. When the Chief of Staff, in his testimony, mentioned that, "quick" and the implication was to you, "too quick." Too quick in the sense of the fact that the whole evolution was too quick. Did he want to raise a specific question--I mean was there an obligation by the Chief of Staff in the implication of it being too quick to ask a question?

A. He specifically told me that he did not notice any action that met the threshold requirement, if you will, to intercede and advise the CO to make a change. He had

a sense things were going faster than he would have expected. But he told me he did not see something that violated the thresholds he had unconsciously set in the way he would observe the ship operate. So again, fruitful to look for further testimony here.

Q. During your investigation, to complete that thought, this was one given situation, but in any given day in a submarine's existence at sea there are other times where important reports must get to the Commanding Officer even if the Commanding Officer is wrong. Do you sense that there was anybody in the GREENEVILLE crew that would provide that sort of forceful backup to this Skipper?

A. Well, that's the issue of trying to understand the command climate and the way the ship routinely operates. And, of course, my ability to do that with the brief and second-hand looks that I got through interviews, is far from a perfect way to do that. I got a sense when I tried to make that assessment that the ship is a very experienced, competent ship that is used to success, that the Commanding Officer is very directive in the way that significant or complicated operations occur. He's directly involved and explicit in what he wants. And frequently, personally directs what he wants. That the ship is acclimated to that approach to business. That is not, by any means, good or bad. I'm just stating that's the characteristics the--of my sense of how this ship works.

One of the potential implications of a ship that operates this way is that the CO doesn't get a lot of corrective input from subordinates, because he's very busy giving directions, and the ship has experienced a lot of success when he does. That's one of the subtleties here that I tried to sense. I did so very imperfectly and I'm not about to tell you I'm confident that that's really the way the ship routinely operated. I just got a sense of that--kind of a glimpse of that, from some of the interviews, some more directly than others but from more than one source.

Now, I want to stress this was not a command where people were shot when they brought things to the Commanding Officer. Kind of the opposite. Very positive command climate. Very nurturing Commanding Officer revered by the crew universally, so we're not talking a situation where people were afraid of the Commanding Officer. It's

a different type of respect. It's more a respect for his abilities and allowing this to--if he says, "that's the way it is," well, then that's okay for me because it's sure worked well for us in the past. So you become accustomed to operating that way.

Now in the case of the second senior officer onboard, the Executive Officer, clearly, he's in a position where he's paid to give the Captain private counsel routinely. And I think that should be pursued in testimony. My sense is that most XO's in the fleet do that. They do it in a way, particularly in this kind of command climate, where only the CO hears the counsel. So that has to be in private settings. This was not a private setting leading into this collision and the manner in which the XO may provide that advise and counsel to the Captain would not be delivered well in this setting. So, there are those kind of human equations going on here. Again, I just want to continue to add, I don't feel confident that I fully understand the true command climate. And I wish I could've done more interviews. I wish I had more time to do more interviews in order to pursue this, but I was not able to.

Q. Admiral, I have a question as it pertains to both the submarine culture as well as, it's training related. Because it's so inherently dangerous just operating at sea, our Navy has a program ORM, Operational Risk Management. And we're attempting and we've been training and working hard to view that as part of our culture of who we are. In that when we go to sea and we operate our ship's decisions whether we're going to go alongside with one engine or two. Our Commanding Officers, our Wardrooms, our crews, are very focused on the safety aspects in peacetime. So we train to perform operational risk management. Does the submarine force endorse that concept? And is there specific training conducted for ships such as GREENEVILLE with regard to risk management?

A. The submarine force does embrace operational risk management. It does conduct training. I don't know if USS GREENEVILLE has done that in the recent past. But that is kind of the way we have always done business. Operational risk management is something that I think we identify very closely with, and have for the history of the Nuclear Power Program, because it's a relentless master for high standards and avoiding accidents.

The answer to your question, I think is, do we have a well-documented ORM instruction type of approach to ORM? Perhaps not. Do we live ORM as a way of doing business routinely? I think very much so. I think that we're also probably more overt in embracing it with instructions and training in recent past. I just don't know the answer on how GREENEVILLE has specifically identified that type of training as different from the way they would routinely approach challenges.

Question by the President:

Q. I take it from your answer then, that for the submarine community it's--though ORM is actually--that description in terms--those terms are actually time late as to the way you guys have always done business. That you felt you had a model for ORM in the way that you operate and the way you did business because that's what you felt that you were in for. That's what you were in terms of the way you operated on a regular basis, whether it was for matters of tactics or for safe operation of the ship.

A. Yes, sir, exactly. You are more articulate than I am.

MBR (RADM STONE): Just to follow-up on the reason why I asked that question, and the coming days we will reveal that, is we look through the various aspects of this incident and come up with facts, such as the display unit being out, a third of the crew ashore, under instruction watchstander without supervision, going through fast--possibly through procedures for TMA and periscope. All these added risks to a routine peace operation require us to study very carefully if we think that really reflects operational risk management, since all of those indicate increased risk for a very routine op. That is all that I have.

PRES: I think we'll recess. This court will recess until 0800 tomorrow morning.

The court recessed at 1620 hours, 6 March 2001.